One Day Conference: The Current State-of-Art in Cardiac MRI

12 July 2014, Saturday
The Langham, Hong Kong, Tsim Sha Tsui

Final Programme

Co-organized by:

香港心臟專科學院
Hong Kong College of Cardiology

Hong Kong College of Radiologists

SCMR
Society for Cardiovascular Magnetic Resonance

Endorsed by:

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MRI Compatibility for Implantable Devices

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MRI Condition: 1.5T full body scan SAR of 4W/kg
Max gradient slew rate of 200T/m/s per axis

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PM1224 PM1124

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MRI Conditions: 1.5T full body scan SAR of 4 W/kg
Max gradient slew rate of 200T/m/s per axis

SJM Confirm™ DM2100

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MRI Condition: 3T or less SAR of 3W/kg for 15 mins
Spatial gradient magnetic field of 720G/cm or less

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MRI Condition: 3T or less SAR of 2W/kg for 15 mins
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Welcome Message

It is our great pleasure and privilege to welcome you to "The Current State-of-Art in Cardiac MRI- One Day Conference", held on 12 July 2014 in the Langham Hotel, Tsim Sha Tsui, Hong Kong.

It is the first joint Cardiac MRI meeting co-organized by the Hong Kong College of Cardiology, the Hong Kong College of Radiologists and the Society for Cardiovascular Magnetic Resonance (SCMR). In order to make this meeting a fruitful one; we have invited the SCMR Board of Trustees, comprised of many of the well known experts from Europe, Canada and USA, to serve as faculty. We have organized a comprehensive and exciting one day program, covering various important topics on cardiac MRI and CT. This is also an effective platform for interaction and sharing interesting and educational cases with overseas experts.

After the conference, we hope to disseminate the precise scientific knowledge to our colleagues and advance our MRI techniques to a global level. We are confident that you will be inspired by the state-of-art knowledge and exhibition on Cardiac MRI.

Last but not least, we would like to express our sincere gratitude to our international faculty, local organizing committee members, participants, secretariat staff, and our generous sponsors. We wish you a most enjoyable and rewarding experience in our one day conference.

Kam Tim CHAN
President of
Hong Kong College of Cardiology

Chun Key LAW
President of
Hong Kong College of Radiologists

Orlando P. SIMONETTI
President of
Society for Cardiovascular Magnetic Resonance

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Institute for Biomedical Engineering of the University and
ETH Zurich
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Andrew Powell
Boston Children's Hospital
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Carlos Rochitte
Heart Institute (InCor) University of São Paulo Medical School
São Paulo, Brazil

Jeanette Schulz-Menger
Charité Campus Buch, University Medicine Berlin
Berlin, Germany

Orlando P. Simonetti
The Ohio State University
Columbus, Ohio, USA

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Conference Information

Organizers
Hong Kong College of Cardiology (HKCC)
Hong Kong College of Radiologists (HKCR)
Society for Cardiovascular Magnetic Resonance (SCMR)

Registration
Advance Registration
Please collect your personal folder and the conference bag at the Registration Counter located at the Foyer on the 2nd Floor, Ballroom, The Langham, Hong Kong. This contains a name badge, program and a certificate of attendance.

On-site Registration (Including Exhibitor Registration)
On-site registration is available at the Registration Counter, payment in cash ONLY (HK or US Dollars).
Hours of Operation: 0800-1500

Registration Fee
Physicians (HKD1,000 / USD125)
Radiographers / Allied Health Professionals (HKD600 / USD75)

Badge Information
You must wear your name badge to gain access to the Congress. Access might be denied if you fail to present your name badge at the entrance. Should you lose your name badge, please contact the Registration Counter for replacement and an administrative fee may be applied.

Certificate of Attendance
Your certificate of attendance will be enclosed in the personal folder.

Lunch and Refreshment Breaks
All the registered participants have free access to the lunch and refreshment breaks which will be served at the Foyer on the 2nd Floor, Ballroom, the Langham, Hong Kong.

Technical Exhibits
Technical Exhibits are located on the 2nd Floor, Ballroom, the Langham, Hong Kong and operation hours are as follows:
Hours of Operation: 0830-1600

Cell Phone and Pagers
As a courtesy to your Fellow attendees, please turn off cell phones and pagers, or set them to silent mode. Phone conversations should not be conducted in the meeting rooms.

Photography and Recording Guidelines
No recording devices of any kind – including audio, video or still photography will be permitted during the symposium.

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Tel: + 852 2899 2035 Fax: + 852 2899 2045
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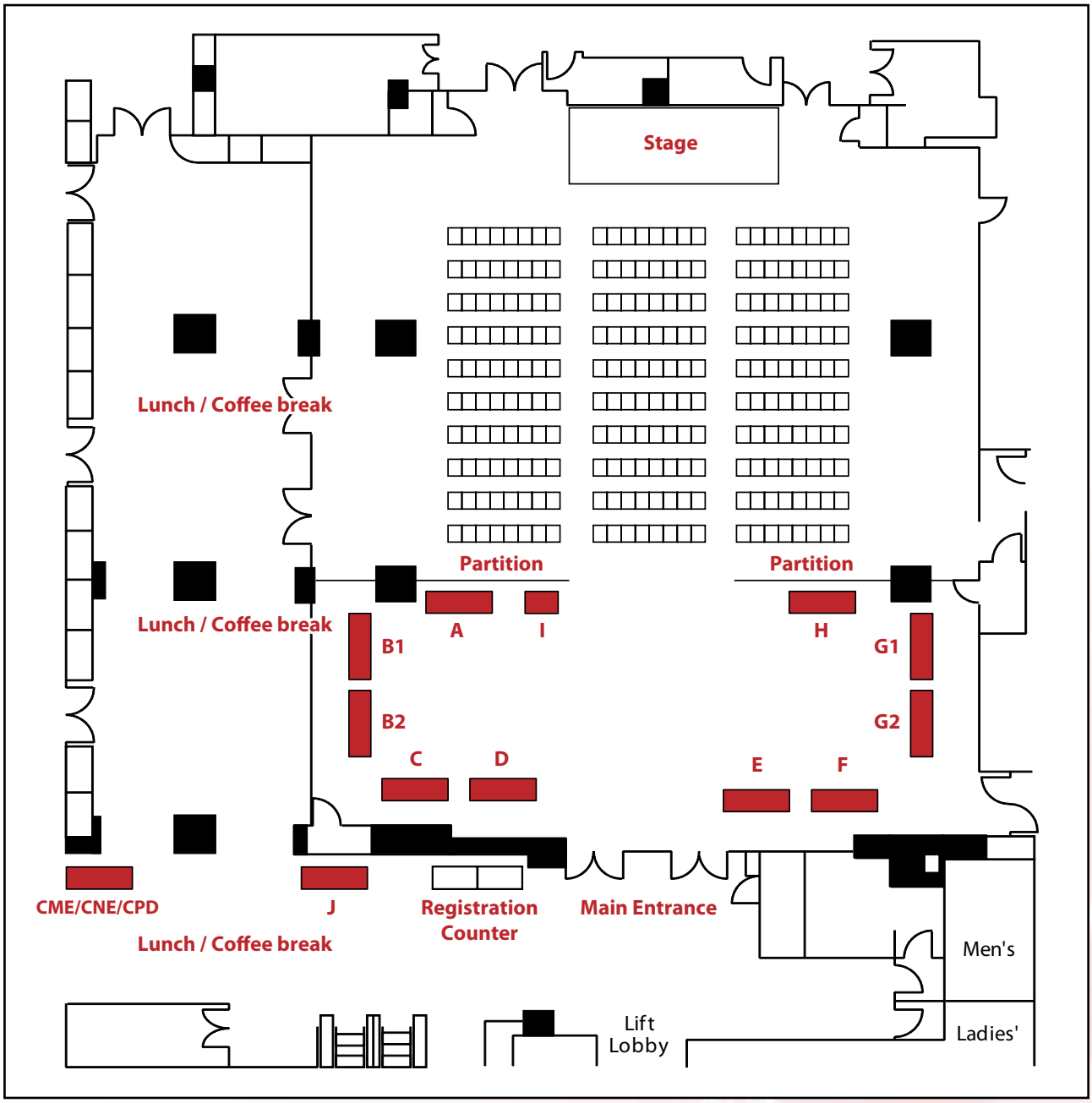
Floor Plan

The Langham, Hong Kong
2nd Floor, Ballroom



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B1+B2: CEMHK

C: AstraZeneca

D: Siemens

E: Bayer

F: Philips

G1+G2: Hospital area

H: Sanko (Toshiba)

I : Circle

J : SCMR

CME/CNE/CPD Accreditation

CME / CNE / CPD Accreditation	Maximum for Whole Function	CME / CPD Category	Other Conditions
Hong Kong College of Anaesthesiologists	6.5	Non-ana	
Hong Kong College of Emergency Medicine	6	PP	
Hong Kong College of Family Physicians	5	Cat. 5.2	
Hong Kong College of Paediatricians	6	Cat. A	
Hong Kong College of Physicians	6.5	Cat. A	
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MCHK CME Programme	5	Passive	Accredited by HKAM
Hong Kong College of Cardiology (CNE)	7.5	N.A.	
Radiographers Board Hong Kong (CPD)	5	N.A.	

Please be reminded to register for your CME/ CNE/ CPD points of the meeting by signing in.

Scientific Programme *(as of 3 July 2014)*

Time	Topic	Speaker
8:30-8:35	Welcome	Kam Tim Chan Chris KY Wong
8:35-8:45	Introduction & Welcome	Orlando P. Simonetti
Chairpersons: Carmen WS Chan and Stephen CW Cheung Session (8:45-10:15)		
8:45-9:05	How CMR works: Perfusion and LGE	Orlando P. Simonetti
9:05-9:25	CMR in ischemic heart disease	Gregory Hundley
9:25-9:45	CCT in ischemic heart disease	Carlos Rochitte
Image acquisition, interpretation and reporting session 1:		
9:45-10:00	CCTA in acute chest pain	John KF Chan
10:00-10:15	CMR in acute coronary syndromes	Pierre Croisille
10:15-10:35	**BREAK**	
Chairpersons: Kam Tim Chan and Winnie Chan Session (10:35-12:05)		
10:35-10:55	How CMR works: Cine and Flow	Frederick H. Epstein
10:55-11:15	CMR evaluation of LV and RV function	Victor A. Ferrari
11:15-11:35	CMR evaluation of blood flow and valves	Jeanette Schulz-Menger
Image acquisition, interpretation and reporting session 2:		
11:35-11:50	CMR in congenital heart disease	Andrew Powell
11:50-12:05	The applications of coronary CTA in percutaneous coronary intervention	Chi Ming Wong
Biotronik Symposium : Chairperson - Chris KY Wong		
12:05-12:30	MR Scanning and Devices	Edward Barin
CEMHK Symposium : Chairperson- to be advised		
12:30-12:55	To be advised	To be advised

Scientific Programme *(as of 3 July 2014)*

Time	Topic	Speaker
12:55-13:35	**Buffet Lunch**	
	Chairpersons: Andrew YW Li and Sherwin SW Lo Session (13:35-15:05)	
13:35-13:55	MR Angiography with and without contrast agents	James Carr
13:55-14:15	Accelerated CMR: changing the imaging paradigm	Sebastian Kozerke
14:15-14:35	The critical role of the CMR technologist	Alison Fletcher
Image acquisition, interpretation and reporting session 3:		
14:35-14:50	CMR in pericardial disease	Michael McConnell
14:50-15:05	CMR in diagnosis and treatment of arrhythmia	Raymond Y. Kwong
15:05-15:25	**BREAK**	
	Chairpersons: David CW Siu and Lawrance KC Yip Session (15:25-16:55)	
15:25-15:45	The evidence supporting CMR	Mark Westwood
15:45-16:05	Establishing a CMR Practice	Edward T. Martin
16:05-16:25	The Global CMR Registry: Its goals and how you can play a role	Raymond Y. Kwong
Image acquisition, interpretation and reporting session 4:		
16:25-16:40	CMR in myocarditis	Jeanette Schulz-Menger
16:40-16:55	CMR in non-ischemic cardiomyopathy	Steffen Petersen
16:55-17:00	Closing Remark	Lilian Leong

Abstracts of Lectures (08:45-09:05)

How CMR Works: Perfusion and Late Gadolinium Enhancement

Orlando P. Simonetti
John W. Wolfe Professor in Cardiovascular Research
The Ohio State University (OSU) in Columbus, Ohio

The standard CMR approach to evaluate myocardial perfusion utilizes a rapid T1-weighted pulse sequence to dynamically image the first pass of gadolinium-based contrast agent through the coronary microcirculation. Vasodilator stress is used to enhance regional flow differences between coronary territories supplied by normal versus stenotic arteries. Myocardial regions with deficient blood flow will not enhance as rapidly, or to as great a degree as normally perfused tissue during the first-pass of contrast agent. The resulting transient differences in gadolinium tissue concentration can be detected using rapid, T1-weighted imaging.

Late Gadolinium Enhancement (LGE) imaging also uses a T1-weighted imaging sequence, but in the case of LGE the images are acquired several minutes following contrast agent injection. Within a few minutes following injection, gadolinium contrast agents distribute within the extra-cellular space of the myocardium and reach a pseudo steady-state. Due to its extra-cellular distribution, there will be a greater concentration of gadolinium in tissue with ruptured cell membranes (e.g., in acute myocardial infarction), and in regions of myocardial fibrosis. Regional differences in gadolinium concentration will cause regional differences in T1, which can be detected by T1-weighted imaging or quantitative T1 mapping.

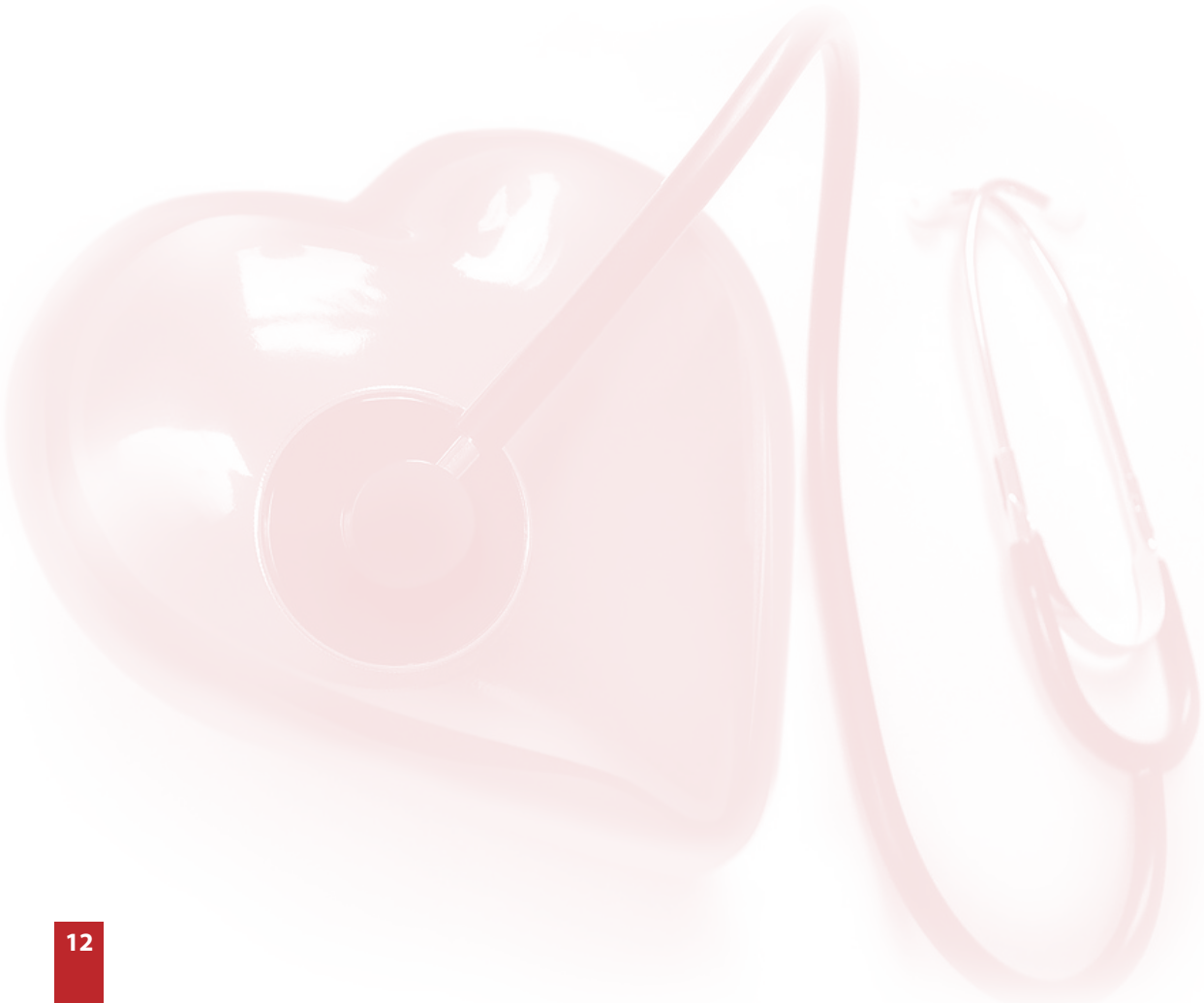
In the presentation, the basic techniques used for CMR first-pass perfusion and LGE imaging will be described, including discussion of limitations, practical tips, and future developments.

Abstracts of Lectures (09:05-09:25)

CMR in ischemic heart disease

WILLIAM GREGORY HUNDLEY, MD
Professor, Internal Medicine (Cardiovascular Medicine) and Radiology

Cardiovascular magnetic resonance has been used to identify the presence of inducible ischemia for the purpose of diagnosing coronary artery disease and forecasting CV risk. This session will review the indications, safety data, and clinical utility of stress related wall motion and perfusion assessments for identifying inducible ischemia utilizing cardiovascular magnetic resonance.



Abstracts of Lectures (09:25-09:45)

CCT in ischemic heart disease

Carlos Rochitte
Associate Professor of Cardiology
Heart Institute (InCor) University of São Paulo Medical School
Cardiovascular MR and CT Director - Hospital do Coração (HCor)
São Paulo, Brazil

Cardiovascular Computed Tomography is currently a well stablished imaging technique for diagnosis and prognostic evaluation of coronary artery disease.

Calcium score is recognised as an extremely powerful prognosticator in asymptomatic patients within the intermediate Framingham risk score.

Coronary CT angiography has also been validated in several multicenter trials, such as CorE64, against invasive coronary angiography. Diagnostic performance is the highest among noninvasive imaging for detection and particularly to the ruling out of obstructive CAD. The negative predictive value of CCTA is extremely high. Lower radiation dose exam for CCTA has recently became the routine examination.

Clinical application of CCTA range from evaluation of chronic CAD to chest pain evaluation and also stent and grafts evaluation. Recently 3 major randomised clinical trials on the use of CCTA in patients coming to a ER with chest pain were published. Results were very promising and supported the use of CCTA in patients with low to intermediate risk of significantly obstructive CAD.

With new CT equipment and better image quality stent evaluation, patients with atrial fibrillation, high heart rate and triple rule out exams became more feasible and routinely performed in advanced cardiology centers.

However, the identification of flow limiting coronary stenosis is still a limitation for CCTA. Therefore, myocardial perfusion studies are frequently needed for intermediate coronary stenosis detected by CCTA.

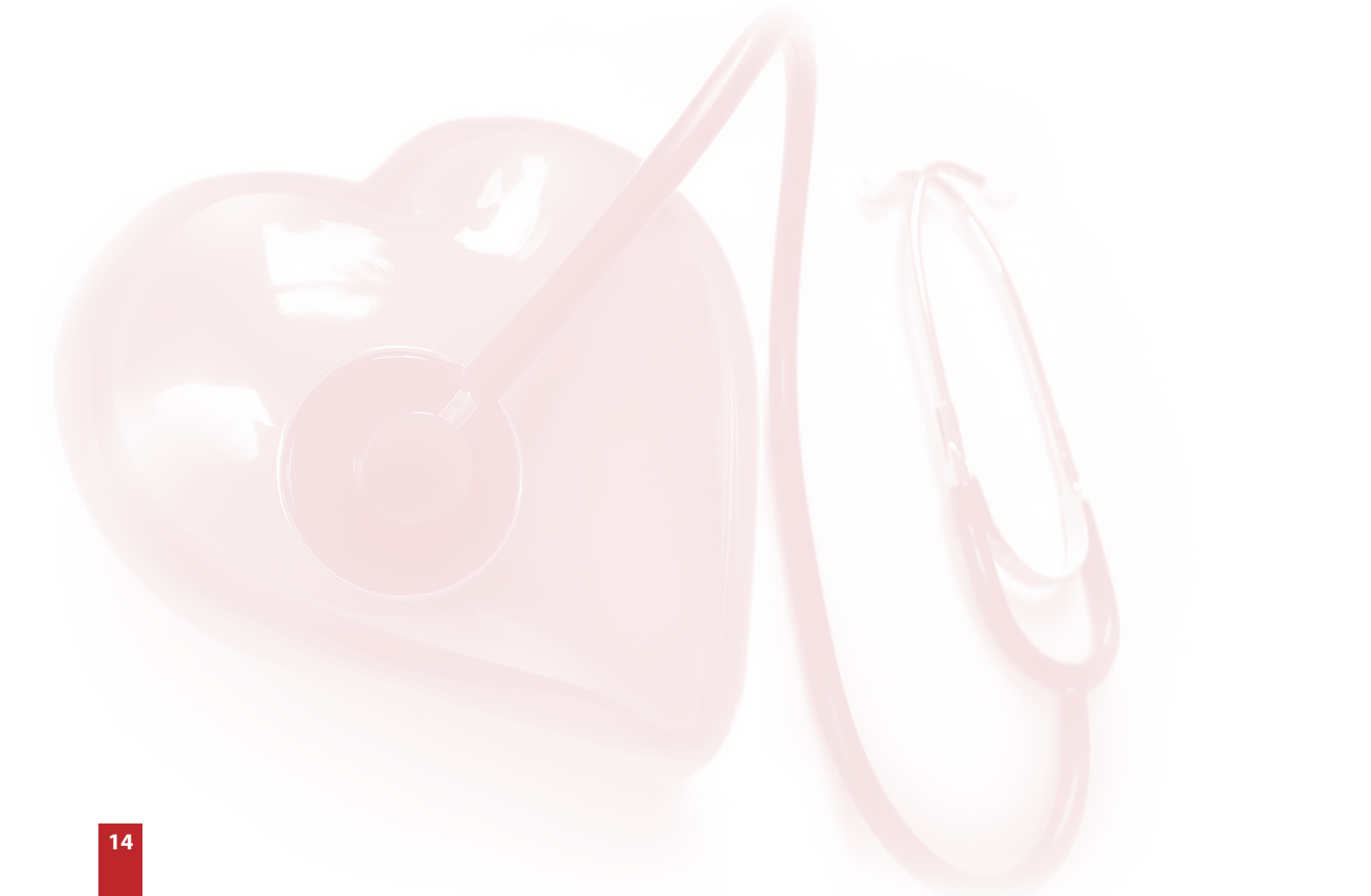
A new method of CT perfusion has been developed and described in animals and unicenter studies. Recently, we have published a multicenter trial validating the CTP method against invasive coronary angiography and SPECT. Results of Core320 trial indicated that CTP could significantly improve the diagnostic performance of CCTA alone to detect flow limiting coronary stenosis.

Another recent investigated approach for detecting flow limiting stenosis was the fractional flow reserve by CT. Despite being extremely promising, this technique is complex, timing consuming and and recent multicenter trials results still preclude its use in clinical scenario.

Atherosclerotic plaque characterisation is also promising in the field of searching for the vulnerable plaque or vulnerable patient.

In the debate of anatomical or functional evaluation for CAD, and specially in the complex cases, both information might be complementary and sometimes needed in combination, for the appropriate patient management.

CT can provide diagnostic usefulness in a wide range of patients scenarios: from the asymptomatic to symptomatic patients and also to patients with known CAD and previously revascularized. This can be achieved by the use of calcium score, CCTA and CTP, techniques that have been already clinically validated.



Abstracts of Lectures (09:45-10:00)

Coronary CT Angiogram (CCTA) in Acute Chest Pain

John KF Chan

Honorary consultant radiologist, Hong Kong Sanatorium & Hospital Honorary associate professor in Radiology, The University of Hong Kong

Acute chest pain is a common complaints in patients attending emergency departments. Underlying causes include acute coronary syndromes (ACS) and non-cardiac etiologies, including pulmonary, vascular, gastrointestinal, and musculoskeletal causes. It is important that life threatening conditions such as acute coronary syndromes, pulmonary embolism, and acute aortic dissection be recognized early so that they can managed appropriately.

Coronary computed tomography angiography (CCTA) may improve the diagnosis and management of acute and stable chest pain syndromes. CCTA has proven value in diagnosis of significant coronary artery disease (CAD). Early CCTA has been suggested to be a safe, fast, and cost-effective modality in the acute setting. In addition, CCTA facilitates early triage of acute chest pain patients and has been recognized as a viable alternative to the traditional standard of care. It is most valuable when ECG and biomarkers are not diagnostic of ACS in low to intermediate risk patients. Recent multicenter trials have reported that coronary CT angiography is safe, reduces time to diagnosis, facilitates discharge, and may lower overall cost compared with routine care.

CCTA has excellent negative predictive value (NPV) for significant CAD. However the positive predictive value (PPV) for ACS is not satisfactory. The incorporation of regional wall motion evaluation, myocardial perfusion studies and detailed plaque assessment might help to improve PPV of CCTA. But these will increase the complexity of examinations.

Simultaneous CT angiogram of coronary artery, thoracic aorta and pulmonary artery, the so called 'triple rule-out' (TRO) protocol has been proposed to examined patients with suspected ACS. It involve higher radiation exposure and iodinated contrast. The precise clinical indications and the appropriate patient population in which the triple rule-out CTA may be preferable to traditional work-up remain unclear.

Abstracts of Lectures (10:00-10:15)

CMR in acute coronary syndromes

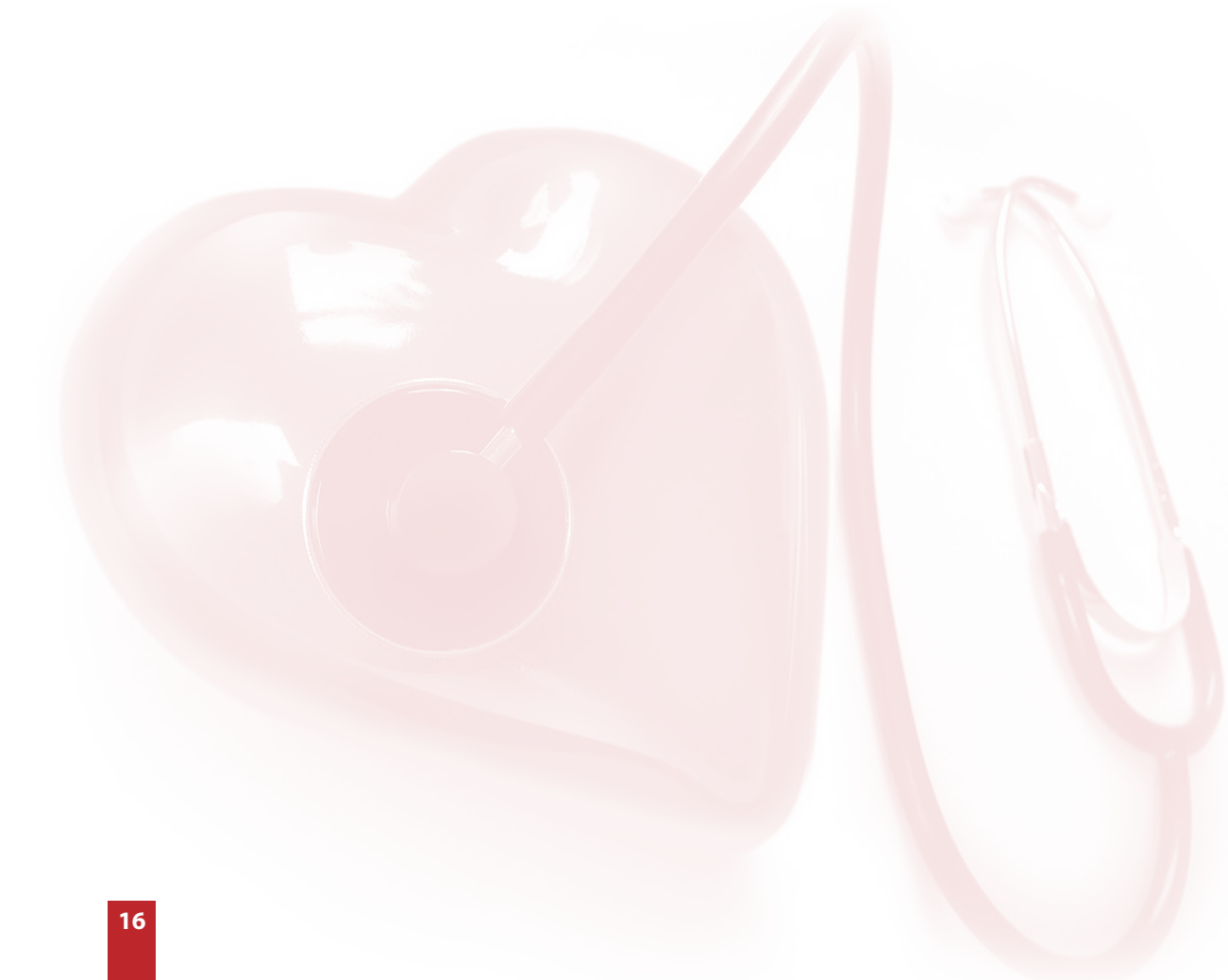
Pierre CROISILLE, MD, PhD
Professor of Radiology
Chairman Radiology and Nuclear Medicine,
University Hospital Saint-Etienne
Deputy Director CREATIS Laboratory, CNRS 5520 INSERM U1044
Université de Lyon, France

To date, CMR has been mostly applied in the assessment of stable disease; however, a role for CMR in the acute setting is also growing.

CMR may serve not only to differentiate ischemic and non-ischemic lesion, but also can size irreversible lesion, function status, and also reperfusion injury.

We will review both established and emerging CMR techniques, and relates the imaging findings to the underlying pathophysiological processes in acute coronary syndromes.

We will discuss the potential of myocardial edema imaging with parametric imaging to characterize myocardial inflammation.



How CMR works: Cine and Flow

Frederick H. Epstein Ph.D.
Professor and Chair of Biomedical Engineering and Radiology
University of Virginia, USA

Cardiac magnetic resonance (CMR) imaging can provide a multiparametric assessment of the heart, including imaging of myocardial structure and function, quantification of flow, and other parameters such as infarction, perfusion, and tissue characteristics (1). For cine CMR imaging of cardiac structure and function, segmented multiphasic acquisitions are generally performed during suspended respiration. Tradeoffs between spatial resolution, temporal resolution, and total scan time must be made to optimize clinical protocols. Modern acceleration techniques can be used to further optimize these protocols, and to realize real-time cine CMR. Cine CMR can be performed using steady state free precession (SSFP) or conventional gradient echo (GRE) readouts, leading to different contrasts between blood and myocardium, and to different sensitivities to turbulent flow. Images may be acquired in various orientations and views, and analysis of multislice and multiplanar cine CMR data provides accurate measurements of cardiac volumes, ejection fraction, wall thickness, and myocardial mass. Cine CMR is generally accepted as the most accurate modality for imaging cardiac function.

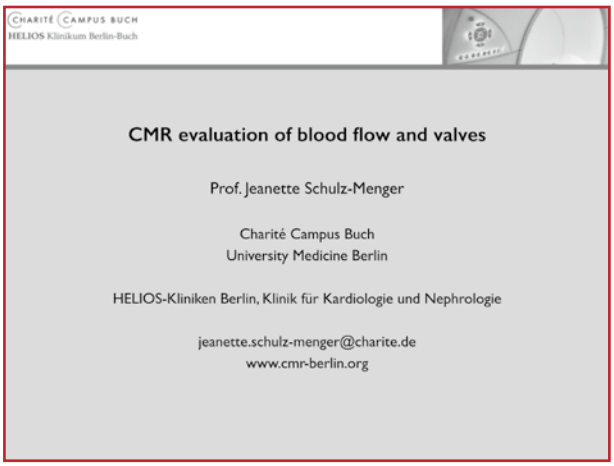
CMR assessment of blood flow is performed using phase-contrast imaging, a technique where blood velocity is encoded into the phase of the MR image. Because phase has a range of ±180°, aliasing artifacts can occur and are typically avoided by proper setting of the velocity-encoding factor. Data are typically acquired using segmented acquisitions, much like for cine CMR, and through-plane flow and/or in-plane flow can be assessed. Recently four-dimensional (4D) flow protocols have become more common, and demonstrate a comprehensive measurement of blood flow throughout a 3D anatomical volume. Together, cine CMR and flow imaging enable accurate assessment of cardiac function and large-vessel blood flow.

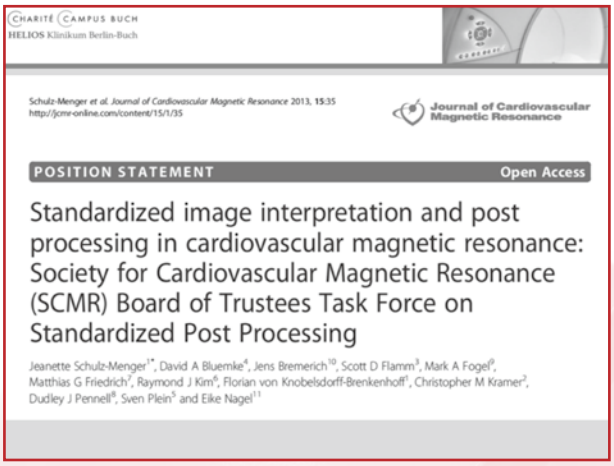
1. Epstein FH. MRI of Left Ventricular Function. J Nucl Cardiol 2007;14:729-44.

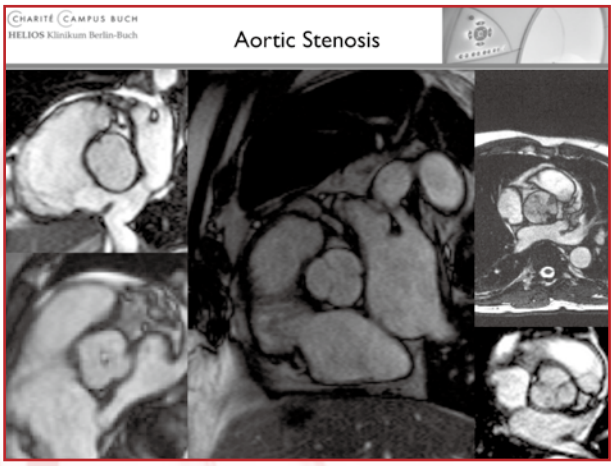
Abstracts of Lectures (11:15-11:35)

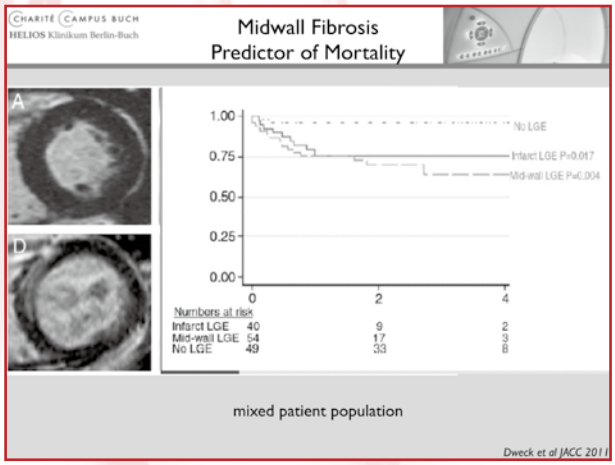
CMR evaluation of blood flow and valves

Jeanette Schulz-Menger, MD
Noninvasive Cardiac Imaging
University Medicine Berlin, Charité Campus Buch
Experimental Clinical Research Center, a joint institution between Charité and MDC
HELIOS Clinics Berlin Buch, Department Cardiology and Nephrology

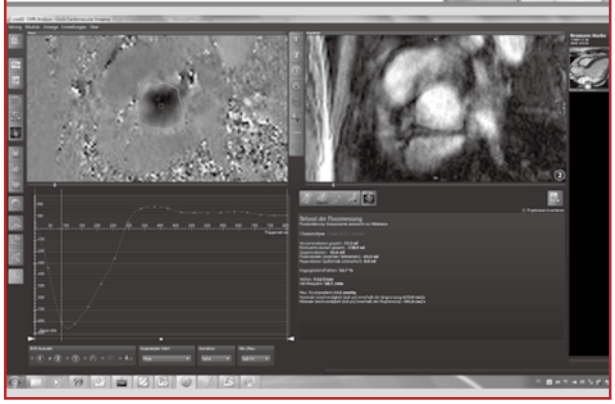




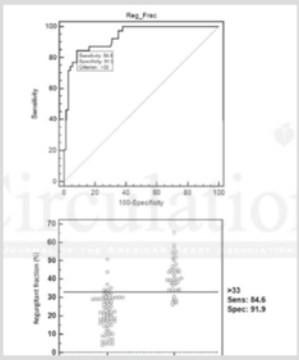




Aortic Regurgitation

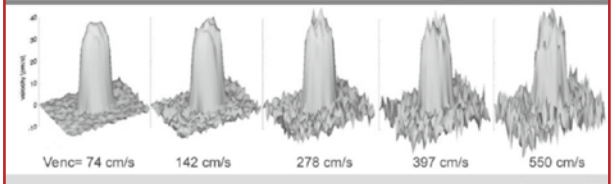


Prognosis

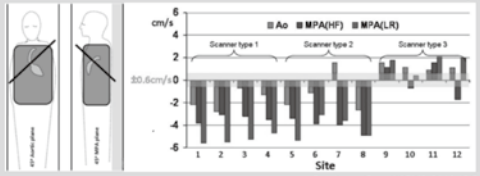


Myerson et al Circulation 2012

Flow Quantification - Pitfalls

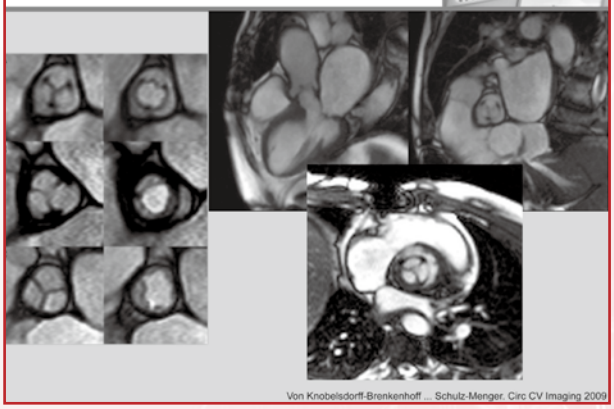


Lotz, Radiographics 2002



Gatehouse P et al. JCMR 2010;12:5

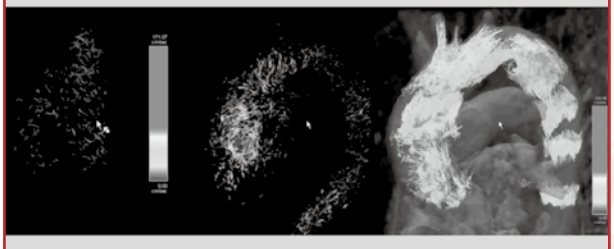
Bioprothesis



Von Knobelsdorff-Brenkenhoff ... Schulz-Menger. Circ CV Imaging 2009

Future ?

Will flow and wallstress help to differentiate?
4D-Flow (phase-contrast)

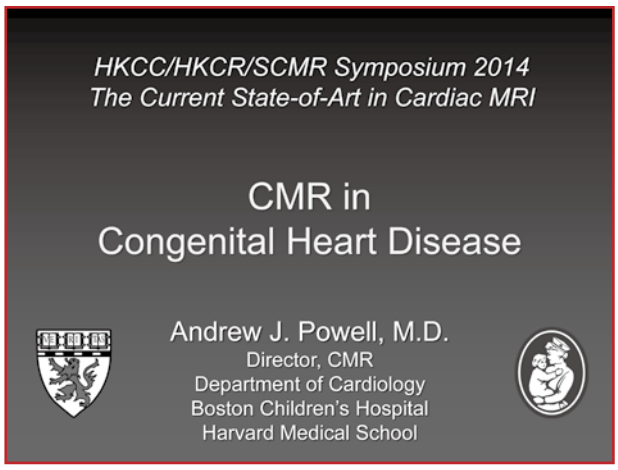


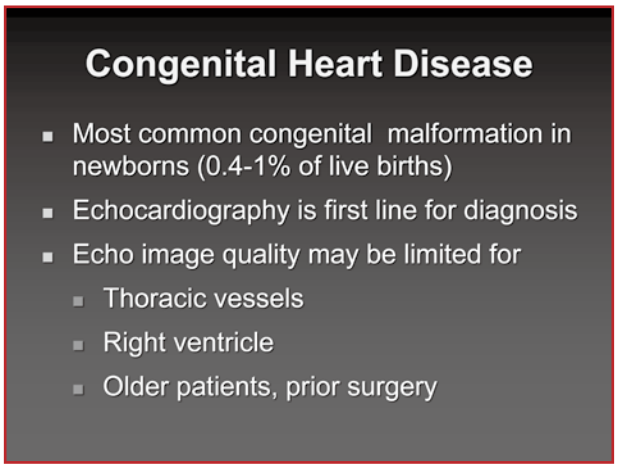
volunteer	Severe AS LVEF 69%	Severe AS LVEF 19%

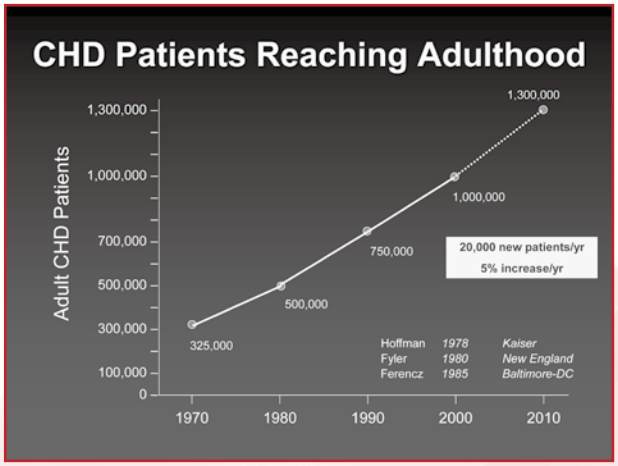
Abstracts of Lectures (11:35-11:50)

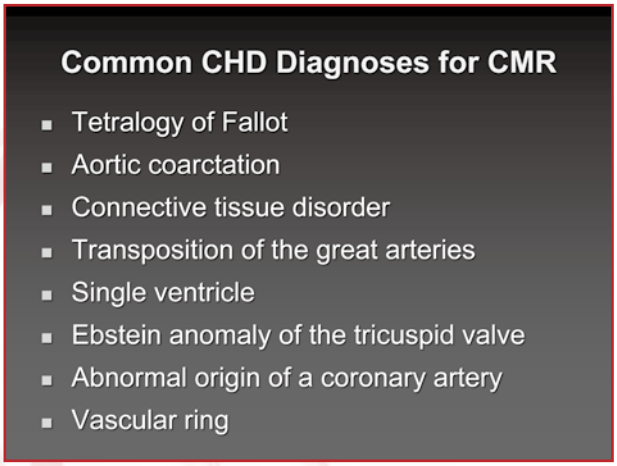
CMR in Congenital Heart Disease

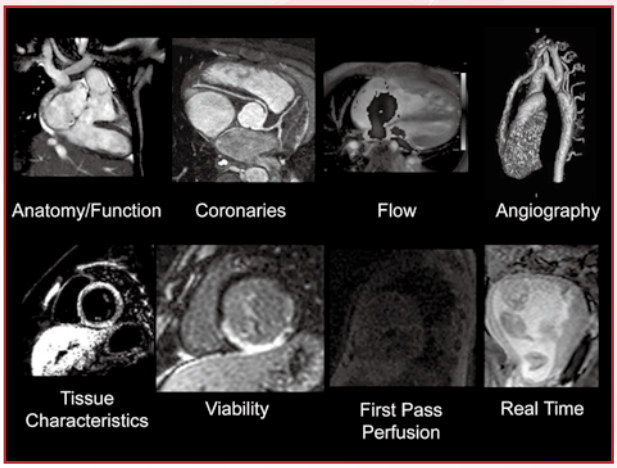
Andrew J. Powell, M.D.
Director, CMR
Department of Cardiology
Boston Children's Hospital
Harvard Medical School

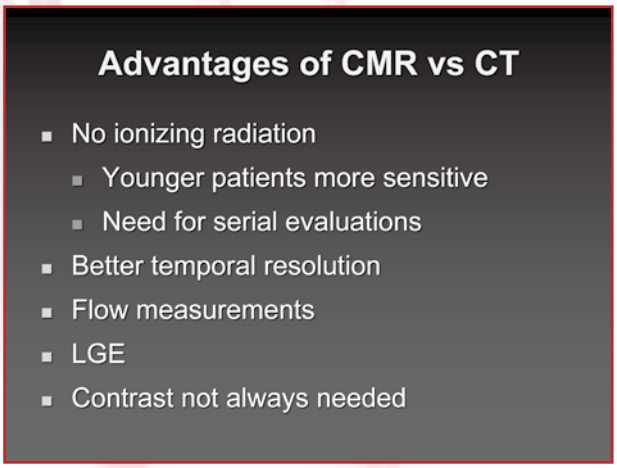








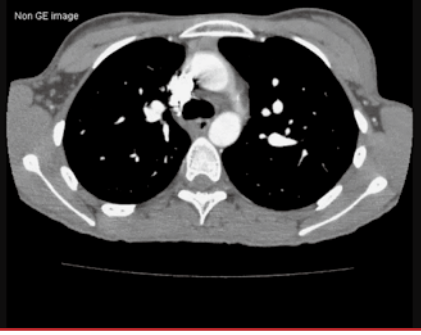




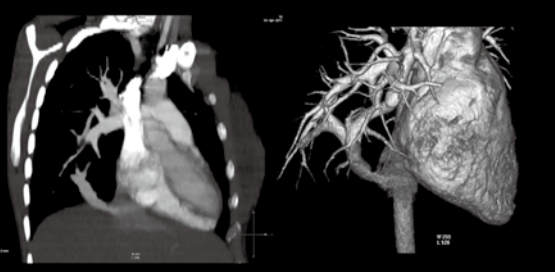
Case 1

- Previously healthy 18 yo woman presented to an emergency room with fever and left scapular pain
- Eventually diagnosed with an epidural abscess
- Elevated D-dimer→ pulmonary embolus?
- CT angiogram with an unexpected cardiac finding

CT Angiogram



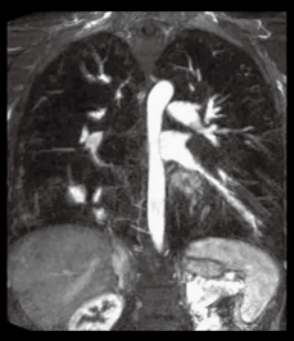
CT Angiogram



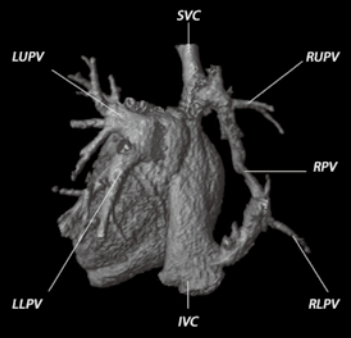
Case 1

- Partially anomalous pulmonary venous return (PAPVR) with the right pulmonary veins connecting to the IVC
- Echo
  - Confirmed the PAPVR diagnosis
  - Dilated RV
- Surgical review
  - Qp/Qs to ensure that the shunt warranted surgery
  - CMR

MR Angiogram



MR Angiogram

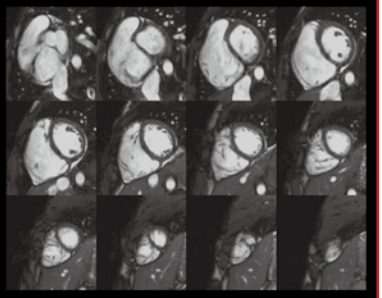


PAPVR: right pulmonary veins drain to both the SVC and IVC

CMR

Right ventricle
EDV_i: 170 mL/m²
Ejection fraction: 58%

Left ventricle
EDV_i: 85 mL/m²
Ejection fraction: 56%



Ventricular short-axis stack

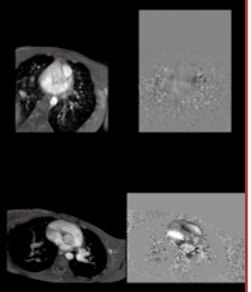
CMR

Flow quantification

Shunt magnitude

$$\frac{Qp}{Qs} = \frac{Q_{MPA}}{Q_{Ao}} = \frac{10.1\ L/min}{5.1\ L/min} = 2.0$$

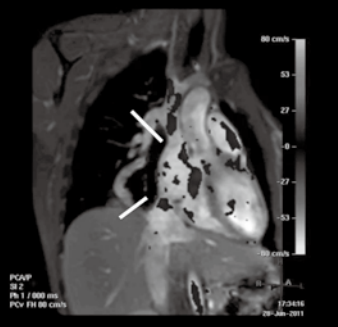
Branch pulmonary artery flow
$RPA = 4.9\ L/min$
$LPA = 5.1\ L/min$



Phase contrast

CMR

Flow quantification
Common right vein:
75% to SVC
25% to IVC

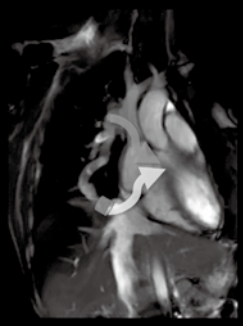


Phase contrast

Operative plan

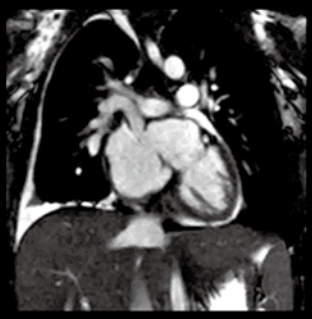
Original Operative Plan
- IVC baffle connecting the right pulmonary vein and left atrium.

Revised Operative Plan
- SVC baffle connecting the right pulmonary vein and the left atrium.
- Band across the pulmonary vein-IVC connection.

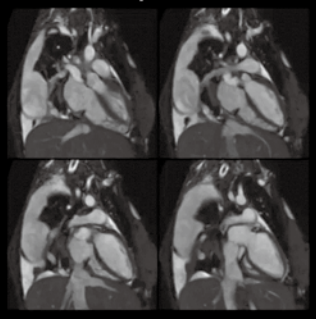


Patient tolerated the operation well

Post-op CMR

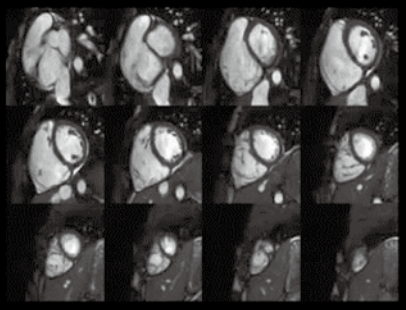


Post-op CMR



Banded pulmonary vein to IVC connection

Post-op CMR

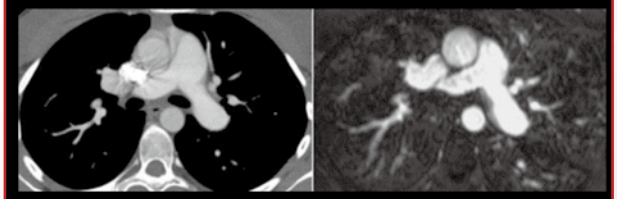


Ventricular short-axis stack

Pre-op vs Post-op CMR

	Pre-op	Post-op
Qp/Qs	2.0	1.0
RV EDV (ml/m^2)	170	125
RV ejection fraction (%)	58	49
LV EDV (ml/m^2)	85	92
LV ejection fraction (%)	56	68

CT vs CMR



CT Angiogram MR Angiogram

Dense contrast in the CT gave the appearance of a boundary between the right pulmonary vein and SVC.

Case 1: Summary

- Unusual variant of PAPVC in which there was right pulmonary venous drainage to both the IVC and SVC, and none to the left atrium
- CMR provided a complete anatomical and functional evaluation both pre- and post-operatively

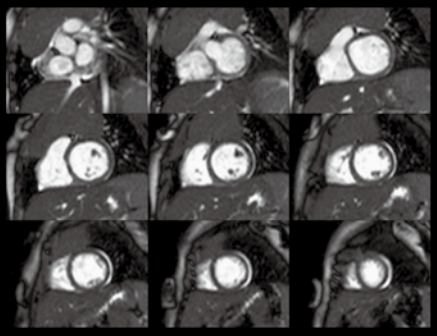
Case 2

- 2.3 kg twin born at 34 weeks gestation
- O_2 sat in low 90s, attributed to prematurity
- Murmur noted at discharge (age 3.5 weeks) → cardiology outpatient visit
- Echocardiogram yielded a diagnosis

Case 2

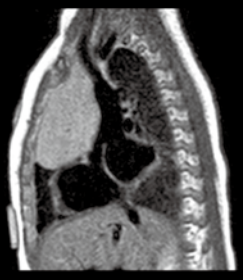
- Referred at age 6 month (6 kg) for CMR for confirmation of the echo diagnosis and further delineation of anatomy
- Hx: feeding well, perioral and acrocyanosis per mom, no dyspnea
- Exam: oxygen sat 93%, minimal visible cyanosis, 1/6 SEM at LSB
- Normal ECG and CXR

Case 2

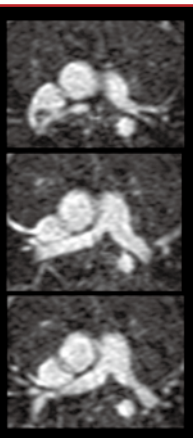


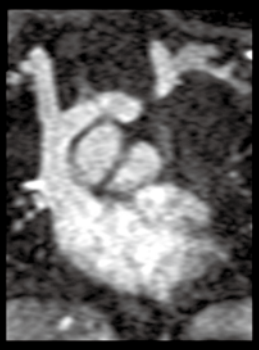
Short-axis cine SSFP

Case 2



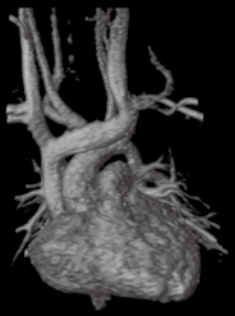
Sagittal TSE DIR





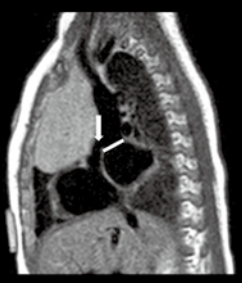
Contrast MRA reformat

Case 2



Contrast MRA volume rendering

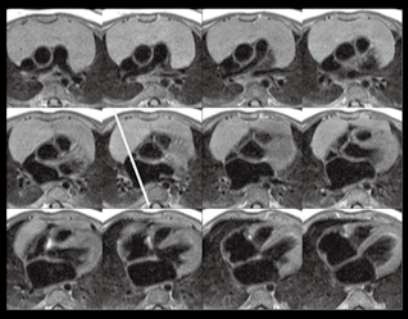
Case 2



Sagittal TSE DIR

- Sinus venosus septal defect
- Narrow SVC-RA junction → bi-atrial drainage (R →L shunt)
- PAPVR of RPVs (L → R shunt)

Case 2



Axial TSE DIR

Case 2

- Qp/Qs=MPA flow / AAo flow=0.87
- RV: EDV=62 ml/m2, EF=65%, SV=40 ml
- LV: EDV=76 ml/m2, EF=62%, SV=47 ml

Case 2: Summary

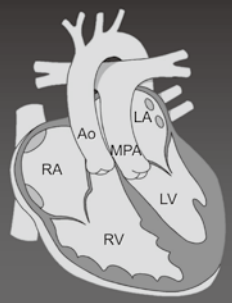
- Bi-atrial SVC drainage
  - Rare cause of cyanosis
  - Associated with right PAPVR
  - Associated with brain abscess (Van Praagh S et al., Pediatr Cardiol 2003;4;350-363)
- Age 8 mo: Patch repair of sinus venosus defect and pericardial patch augmentation of the SVC and RA
- CMR useful to define the anatomy and physiology

Case 3

- 28 yo with transposition of the great arteries (TGA) who had undergone an atrial switch operation at age 10 mo
- History of atrial flutter
- Minimal symptoms
- Exercise test
  - Desaturation to 85%

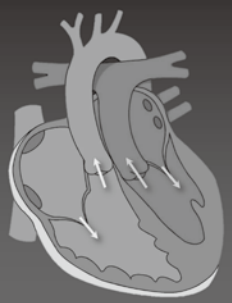
TGA

- Aorta arises from the RV
- MPA arises from the LV



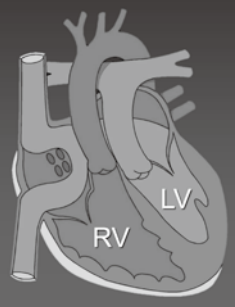
TGA

- Aorta arises from the RV
- MPA arises from the LV



Atrial Switch for TGA

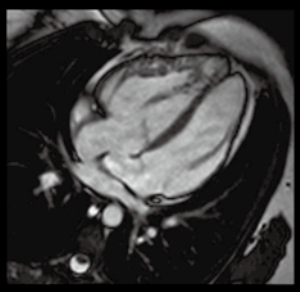
Senning and Mustard operations



Case 3

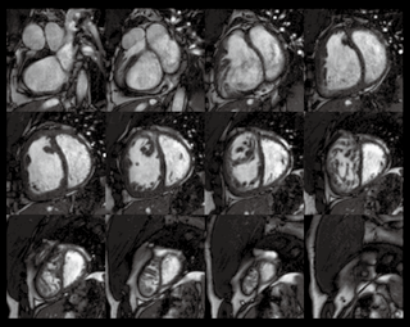
- CMR ordered for evaluation of RV function and assessment of the atrial baffle

Case 3



Baffle leak

S/p Atrial Switch



SSFP cine short-axis

Case 3: Summary

- CMR is useful for the evaluation of patients who have undergone an atrial switch operation for TGA
  - RV function
  - Atrial baffle pathways
  - Atrial baffle defects
- CMR helped determine suitability for percutaneous intervention

Cardiovascular MR Program
Boston Children's Hospital

Staff Physicians
Tal Geva
Andrew Powell
Laureen Sena
Oscar Benavidez
Anne Marie Valente
Rebecca Beroukhim
Ashwin Prakash
Puja Banka
Rahul Rathod

Technologists
David Annese
Maria Valenza
Bradley Bares
Will Campbell

MR Scientist
Mehdi Hedjazi Moghari

Scheduler
Kelly Walsh

Abstracts of Lectures (11:50-12:05)

The applications of coronary CTA in percutaneous coronary intervention

C.M. Wong, FRCP, FHKAM, FACC, FSCAI, FSCCT
Medical Superintendent, St. Teresa's Hospital

Amongst the coronary imaging modalities available, coronary CT angiogram (CCTA) distinguishes itself as an invaluable tool before, during and after percutaneous coronary intervention (PCI). Given the superior temporal and special resolution of invasive coronary arteriogram (ICA), one may be surprised why the interventional cardiologists find CCTA useful. CCTA offers a 3D view of the heart. It can visualize the coronary artery tree from unlimited projections, can visualize the distribution, size and composition of the atherosclerotic plaque, and is non-invasive.

Since 2004, an increasing number of patients undergoing percutaneous coronary intervention (PCI) in our heart center have a CCTA prior to PCI. CCTA can effectively defer those patients with mild disease who will not benefit from ICA. It has been used extensively for strategic planning in those patients requiring intervention. Given this additional information, the complication rate decreases and overall, patients have a better outcome. In our experience, almost all patients undergoing PCI benefit from CCTA findings. Typical cases which illustrate this point will be discussed.

CCTA can also be used during the PCI procedure. Co-registration of the CCTA and ICA has been found to be useful in chronic total occlusion. It can also be used in assessing the distribution and nature of the plaques along the coronary artery and in obtaining the best projection to perform the PCI procedure.

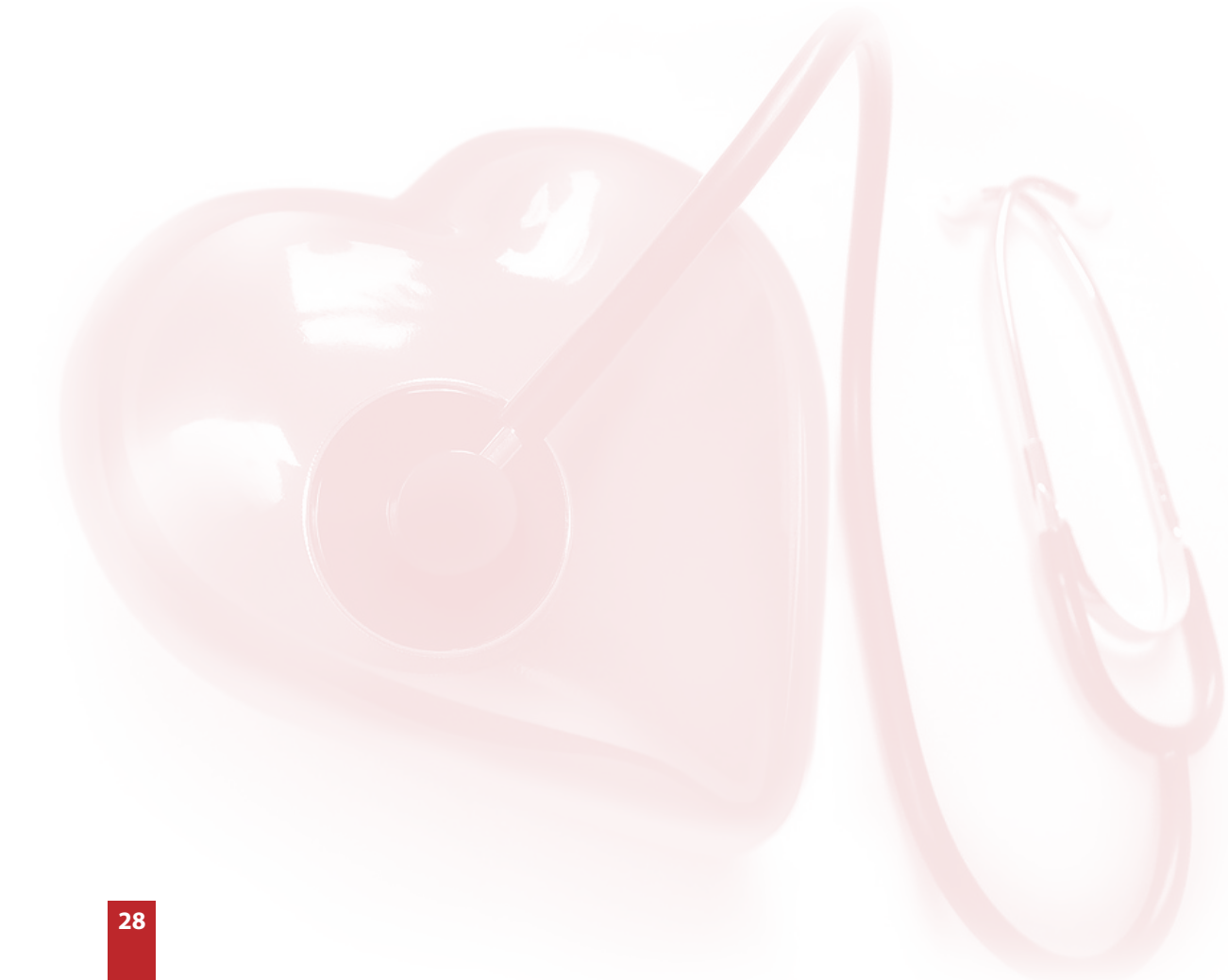
In the follow up of patients with stent implantation, the use of CCTA has been limited due to the blooming artifact produced by the stents. With the introduction of better scanner and the increasing use of bioresorbable stents, CCTA has been used extensively in the follow up of these patients. Cost and radiation have been the limiting factors in the widespread use of CCTA. In most patients, the latest CT scanners reduce the dose of CCTA to less than half m-Sievert. It is likely CCTA will be used more routinely in practice where cost is no concern.

Abstracts of Lectures (12:05-12:30)

Biotronik Symposium: MR Scanning and Devices

Edward Barin
Macquarie University Hospital Clinic and RNSH Sydney

The use of MR scans in patients with implantable devices is increasing. The demographics of both populations of subjects are near identical. Whereas an implanted device was previously a contraindication to MR scanning, present device technology enables safer MR scanning under specified conditions. Improved safety is assured by new portfolios of MR-conditonal devices, for both bradycardia support and defibrillator systems. This presentation summarises the current issues in device scanning with MR, the technical challenges and their state of development. Important clinical aspects regarding safety protocols which are used and the evolving guidelines in routine clinical practice are reviewed.



Abstracts of Lectures (13:35-13:55)

MR Angiography with and without contrast agents

James Carr
Professor of Radiology and Medicine
Northwestern University, Feinberg School of Medicine
Chicago, Illinois, USA

This presentation will demonstrate the technical and clinical applications of contrast enhanced and non-contrast magnetic resonance angiography (MRA).

MRA is routinely used to evaluate the vasculature in a non–invasive fashion. Contrast enhanced MRA can be implemented as a conventional timed flow arrest protocol or as time resolved dynamic imaging. The technical aspects of both of these approaches will be described in detail. Several different Gadolinium based contrast agents are routinely used for CEMRA including both extracellular and blood pool agents. Methods for optimal utilization of contrast agents for MRA will be described. Because of the risk of NSF with gadolinium use in patients with renal failure, there has been renewed interest in non contrast MRA techniques. Several of these NCMRA approaches will be discussed. Through a series of case presentations, this talk will attempt to illustrate the optimal use of all of these techniques in clinical practice.

At the end of this lecture, attendees should understand the basic technical principles for CEMRA and NCMRA and will also be more familiar with the appropriate clinical indications for using these techniques.

Abstracts of Lectures (13:55-14:15)

Accelerated CMR: changing the imaging paradigm

Sebastian Kozerke, PhD

Professor of Bioimaging at the Institute for Biomedical Engineering of the University and ETH Zurich, Switzerland.

The talk will review contributions the group has made to the field of accelerated dynamic imaging of cardiac perfusion, flow, function and tissue mechanics. Results from the recent multi-center 3D cardiac perfusion trial will be presented. An update on data-driven reconstruction methods that are able to account for object motion, vector field divergence and other physical prior information will be given along with explorations into nonlinear transform domains for improved accelerated CMR. Finally, recent methods and results of dynamic nuclear polarization for real-time metabolic MR imaging of the heart are presented.

Abstracts of Lectures (14:15-14:35)

The Critical Role of the CMR Technologist

Alison Fletcher
Papworth Hospital NHS Foundation Trust, U.K

The CMR technologist is instrumental in obtaining images of the highest quality. From pulse sequence set up and manipulating scan parameters in line with the patients' physiology to managing image artefacts or patient non compliance.

There are many parameters that can be altered when setting up and performing CMR and it is important that the CMR technologist understands how they affect the acquisition in order to obtain the highest quality images.

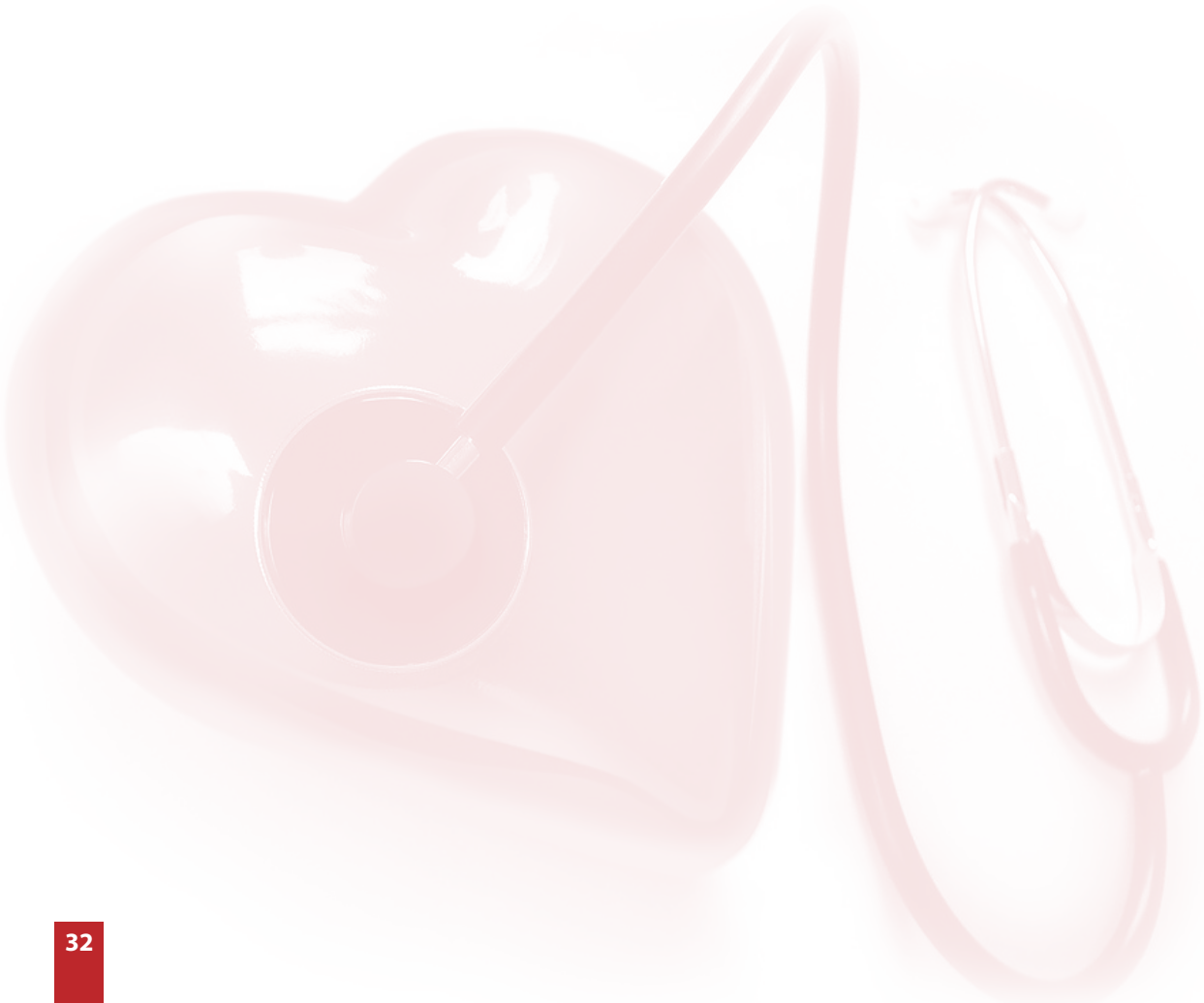
Abstracts of Lectures (14:50-15:05)

CMR in diagnosis and treatment of arrhythmia

Raymond Y. Kwong, MD, MPH

Director of Cardiac Magnetic Resonance (CMR) Imaging at Brigham and Women's Hospital (BWH) and Associate Professor of Medicine at Harvard Medical School

CMR is a remarkable tool that can correlate cardiac structures and tissue composition that are crucial factors in the pathogenesis of various cardiac arrhythmias. Over the past decade, various CMR methods aiming to in improving the diagnosis, risk assessment, and even pre-procedural planning of invasive treatments of patients with various arrhythmias had been developed and some have been adapted clinically. This lecture aims to review some of these clinical tools as well as presenting some of the novel investigative research.



Abstracts of Lectures (16:05-16:25)

The Global CMR Registry: Its goals and how you can play a role

Raymond Y. Kwong, MD, MPH

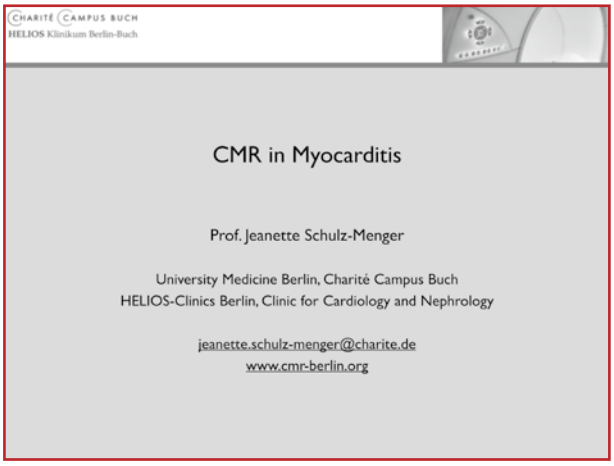
Director of Cardiac Magnetic Resonance (CMR) Imaging at Brigham and Women's Hospital (BWH) and Associate Professor of Medicine at Harvard Medical School

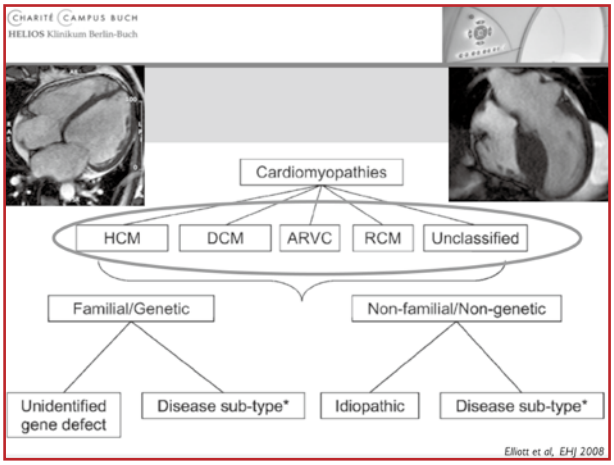
Over the past decade, the CMR community has provided high quality data regarding superior diagnostic and prognostic efficacy of cardiovascular magnetic resonance (CMR). Real-world data regarding CMR's worth in routine medical care are needed to support CMR's relevance across the spectrum of patients with known or suspected cardiovascular diseases that are commonly encountered in daily practice. These data are critical to support appropriate growth of CMR guided by clinical evidence. A global CMR registry (GCMR) will provide crucial infrastructure to demonstrate the value of CMR beyond the CMR community to payors, regulators, vendors, industry, and academia. It will provide the largest body of evidence to support CMR's effectiveness as a toll to guide patient management. It will also reflect the current clinical applications of CMR in routine patient care with the capacity to target defined subgroups. These data can support the development of appropriateness criteria. Last but not least, these data can reflect any change in patient impact from CMR over time as technical development evolves further. In this lecture, the current approach, rationale, and infrastructures of the GCMR will be discussed.

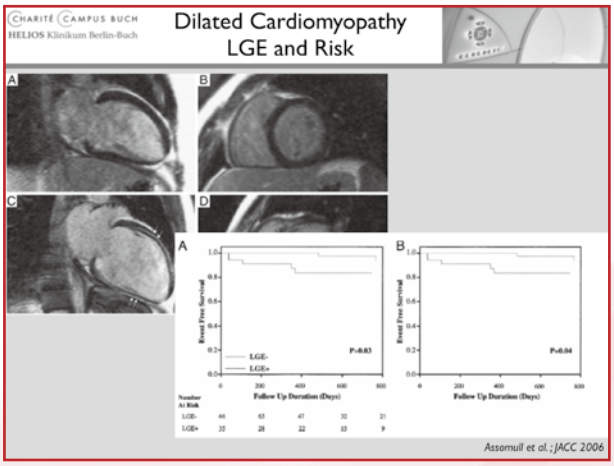
Abstracts of Lectures (16:25-16:40)

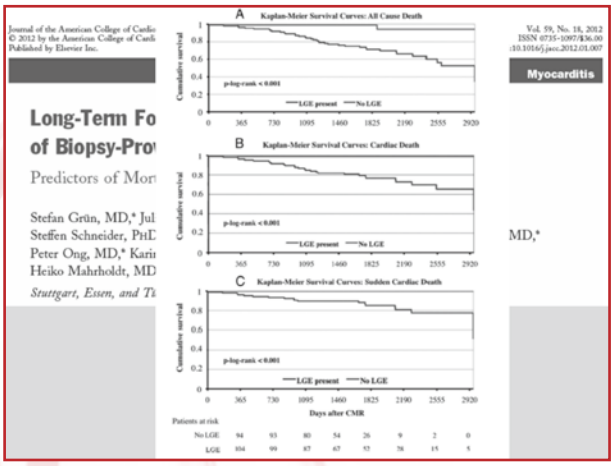
CMR in myocarditis

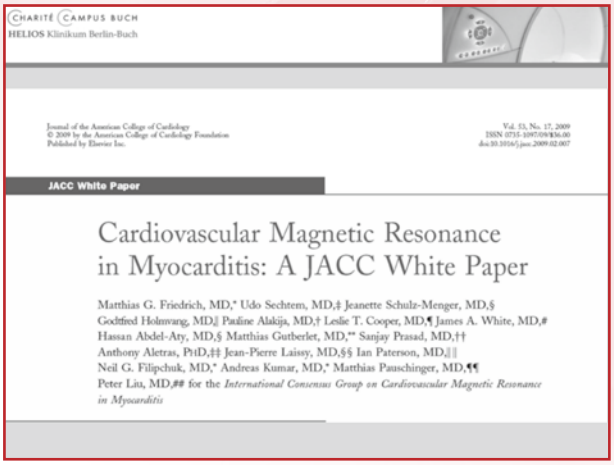
Jeanette Schulz-Menger, MD
Noninvasive Cardiac Imaging
University Medicine Berlin, Charité Campus Buch
Experimental Clinical Research Center, a joint institution between Charité and MDC
HELIOS Clinics Berlin Buch, Department Cardiology and Nephrology

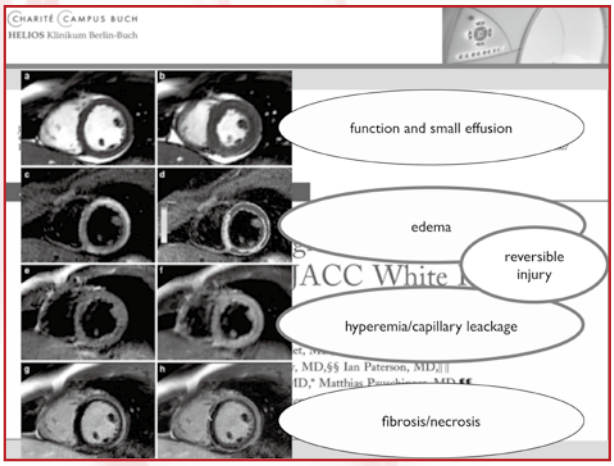


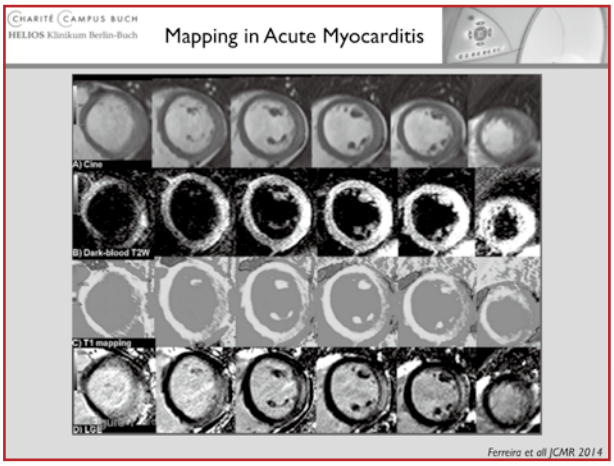


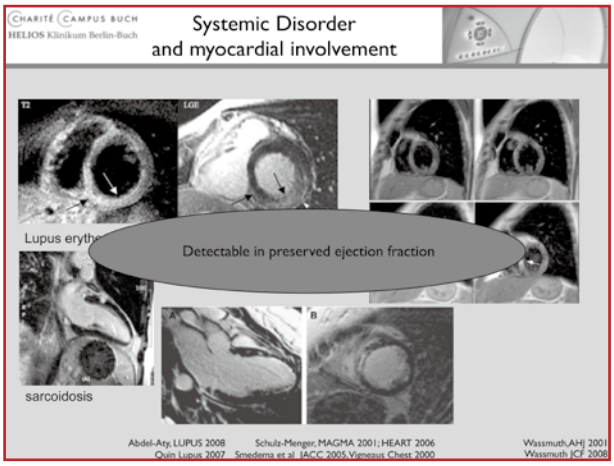









CHARITÉ CAMPUS BUCH
HELIOS Klinikum Berlin-Buch
Mapping in Acute Myocarditis
A) Cine
B) Dark-blood T2W
C) T1 mapping
D) LGE
Ferreira et all JCMR 2014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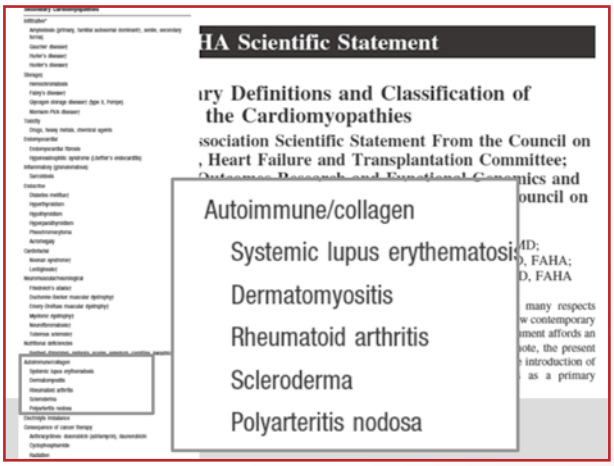
Systemic Disorder
and myocardial involvement
T2
LGE
Lupus erythe
Detectable in preserved ejection fraction
sarcoidosis
Abdel-Aty, LUPUS 2008
Quin Lupus 2007
Schulz-Menger, MAGMA 2001; HEART 2006
Smedema et al IACC 2005 Vignezus Chest 2000
Wassmuth,AHJ 2001
Wassmuth JCF 2008


HA Scientific Statement
ıry Definitions and Classification of
the Cardiomyopathies
ssociation Scientific Statement From the Council on
, Heart Failure and Transplantation Committee;
ouncil on
Autoimmune/collagen
Systemic lupus erythematosis
Dermatomyositis
Rheumatoid arthritis
Scleroderma
Polyarteritis nodosa


CHARITÉ CAMPUS BUCH
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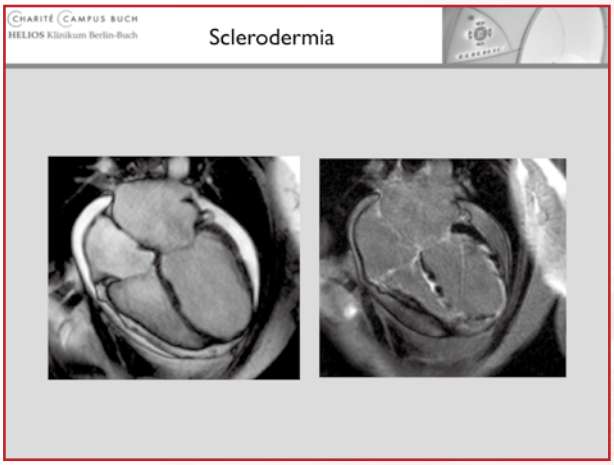
Clinical awareness
592
299
6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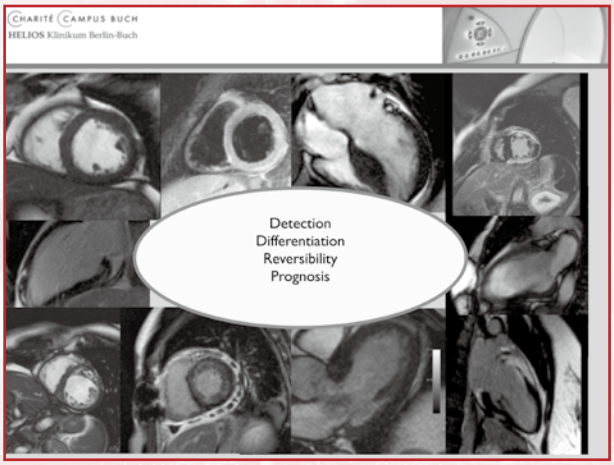
Sclerodermia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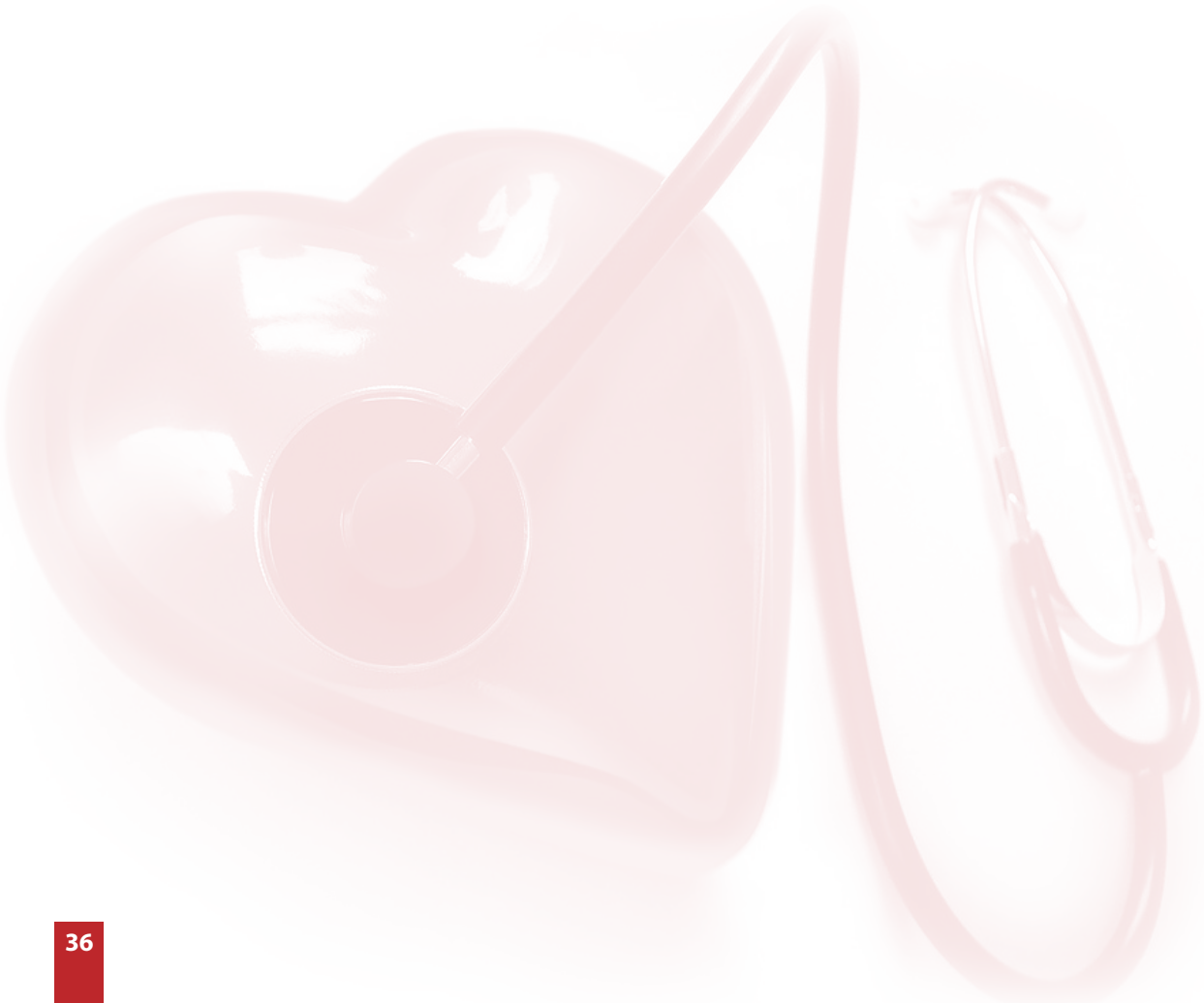
Detection
Differentiation
Reversibility
Prognosis

Abstracts of Lectures (16:40-16:55)

CMR in non-ischemic cardiomyopathy

Steffen E. Petersen
Consultant Cardiologist
Professor of Cardiovascular Medicine Centre Lead

This presentation will provide an overview of important non-ischemic cardiomyopathies and detail evidence for the role of CMR in diagnosing, risk-stratifying and decision-making in such conditions. The presentation will not cover comprehensively all non-ischemic cardiomyopathies due to time-constraints, but explore the potential of CMR in selected non-ischemic cardiomyopathies.



Acknowledgement

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Tel: +852 2899 2035
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