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'Seeing the Heart of the Matter'
Advances in Cardiac Imaging and the Insurance Industry



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Optional presentation descriptor

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'Seeing the Heart of the Matter' –
Introduction:

- Background of non invasive cardiac Imaging
- Current Imaging
- The Future

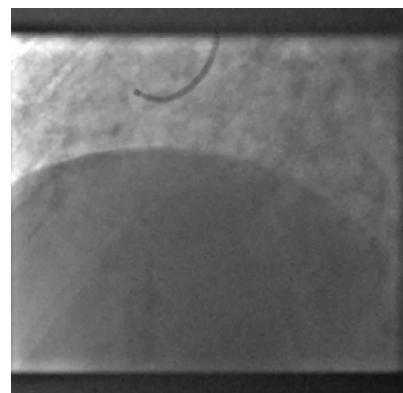
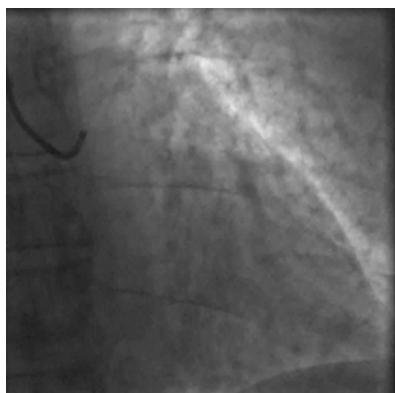
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What is 'Non invasive Cardiac Imaging?

- 'Any technique to image the heart using catheters (small tubes) OR does not involve directly via veins or arteries into the heart structures'

Everything except a coronary angiogram

Coronary Angiography

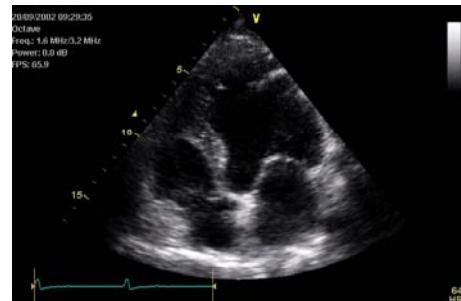
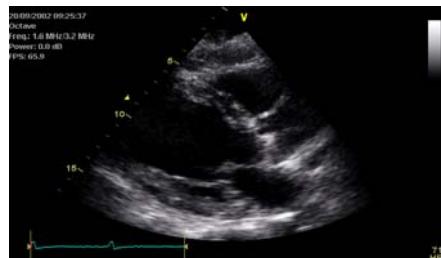


Current Non Invasive Techniques

Current methods of cardiac Imaging

- *Transthoracic Echocardiography (TTE)*
- *Transoesophageal Echocardiography (TOE)*
- *Nuclear Cardiology*

Transthoracic Echocardiography (TTE)

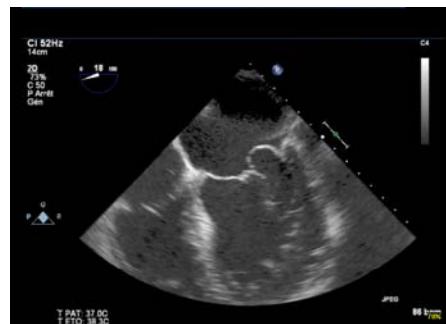
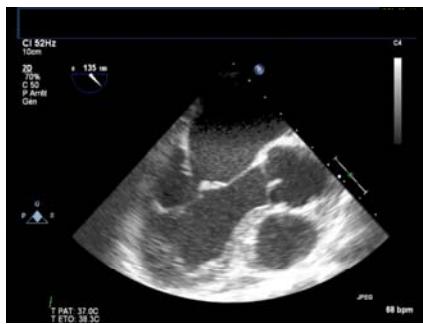


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Transoesophageal Echocardiography (TOE)



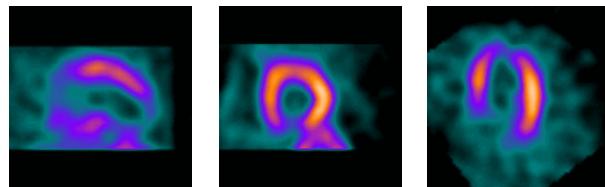
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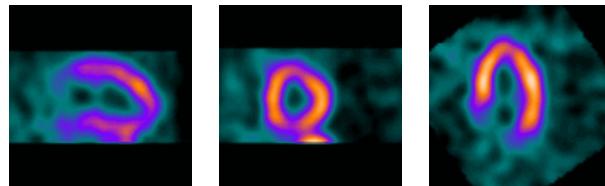
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Nuclear Cardiology

Stress



Rest



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New methods of cardiac Imaging

CMR

CT

3D Echo

Muscle

Arteries

Valves

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CMR



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Cardiac MRI (CMR)

- *Fast*
- *Reliable and Reproducible Results*
- *No Ionising Radiation (X-Rays, Radioactivity)*
- *Unlimited Views*

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CMR: Why bother?

Ventricular Function

- Viability
- Ischaemia
- Cardiomyopathy
- Congenital Heart Disease

All in a single 30 minute assessment

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CMR: Current Indications – Europe 2004

Indication	Class
1. Assessment of global ventricular (left and right) function and mass	I
2. Detection of coronary artery disease Regional left ventricular function at	II
Assessment of myocardial perfusion MRA (CAD)	III
Coronary MRA (anomalies)	I
Coronary MRA of bypass graft patency	II
MR flow measurements in the coronary arteries	Inv
Arterial wall imaging	Inv
3. Acute and chronic myocardial infarction Detection and assessment Myocardial viability	III
Ventricular septal defect	III
Mitral regurgitation (acute MI)	III
Ventricular thrombus	II
Acute coronary syndromes	Inv

Indication	Class
1. Valve morphology Bicuspid aortic valve	II
Other valves	III
Vegetations	Inv
2. Cardiac chamber anatomy and function	I
3. Quantification of regurgitation	I
4. Quantification of stenosis	III
5. Detection of paravalvular abscess	Inv
6. Assessment of prosthetic valves	Inv

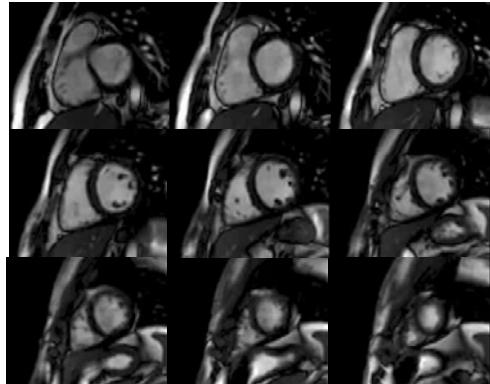
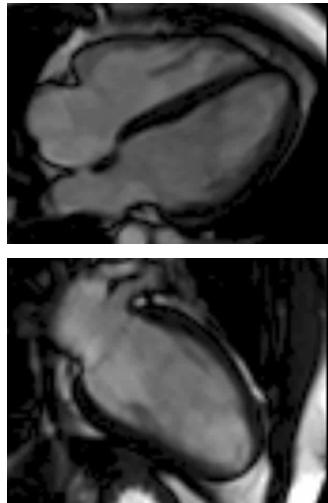
Class I
Clinically relevant information.
First line imaging technique.
Substantial literature.

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CMR: Function - Normal

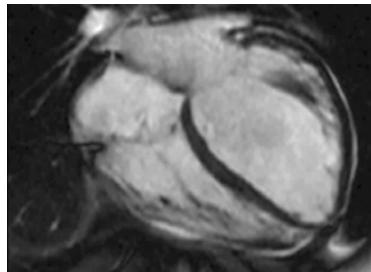
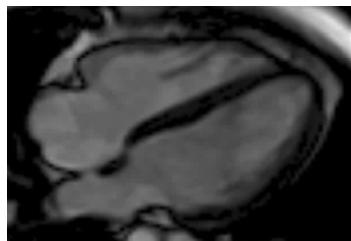


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CMR: Function – Impaired (Global)

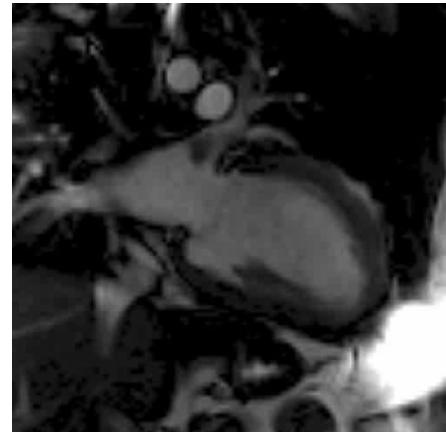
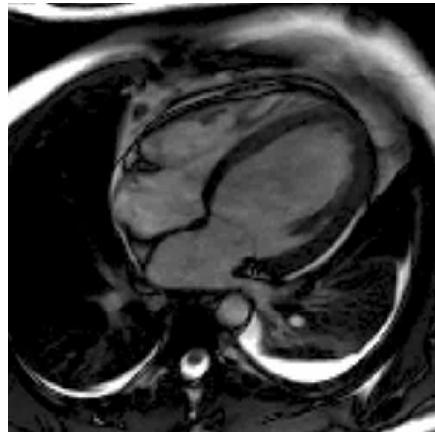


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CMR: Function – Impaired (Regional)

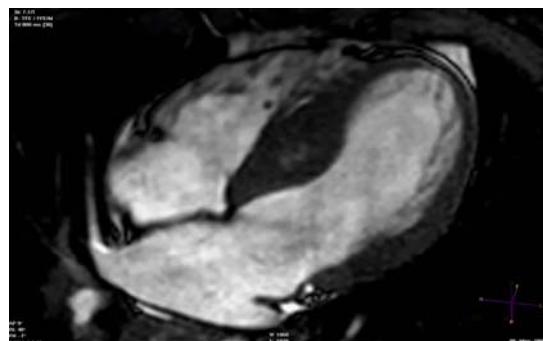


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CMR: Function - Cardiomyopathy

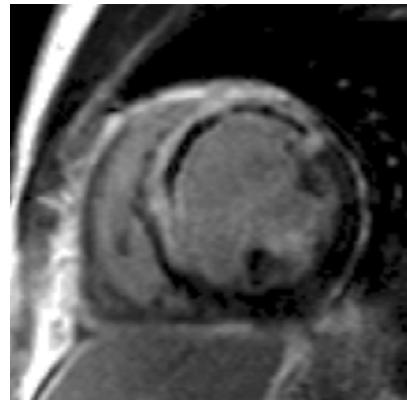
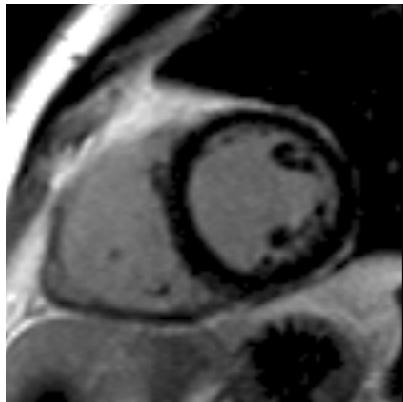


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CMR: LGE - Infarction



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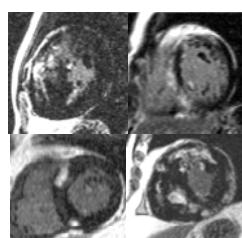
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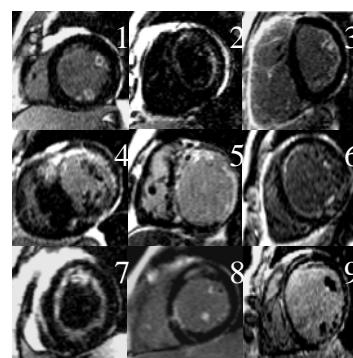
CMR: LGE - Cardiomyopathy



Myocardial Infarction



HCM



- 1.Sarcoid – 2.amyloid – 3.Scleroderma –
- 4.Fabrys – 5.GSDIIIa – 6.ChurggStrauss –
- 7.Loefflers – 8.myocarditis – 9.DCM

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CMR: Viability

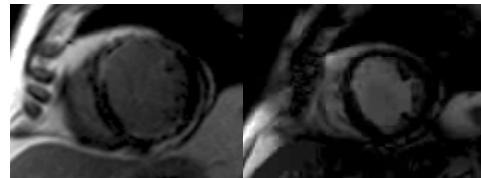
Basal short axis:

The endocardial rim of late gadolinium enhancement is seen confirming viable inferior myocardium. Small amount of septal late gadolinium.



Mid short axis:

Inferior wall as above. There is full thickness myocardial infarction in the anterior and anteroseptal walls.



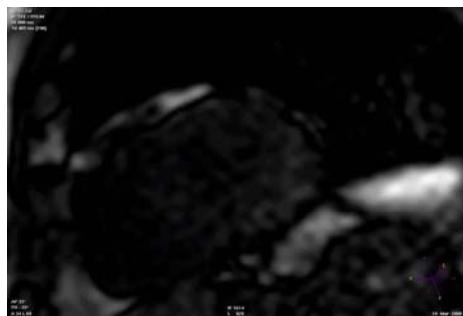
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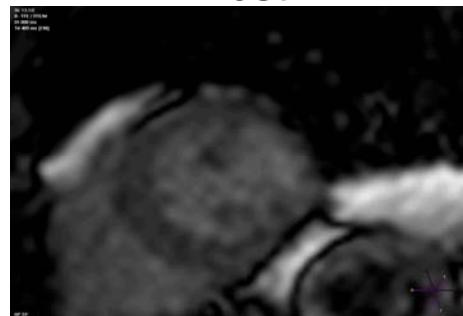
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CMR: Perfusion

Stress



Rest

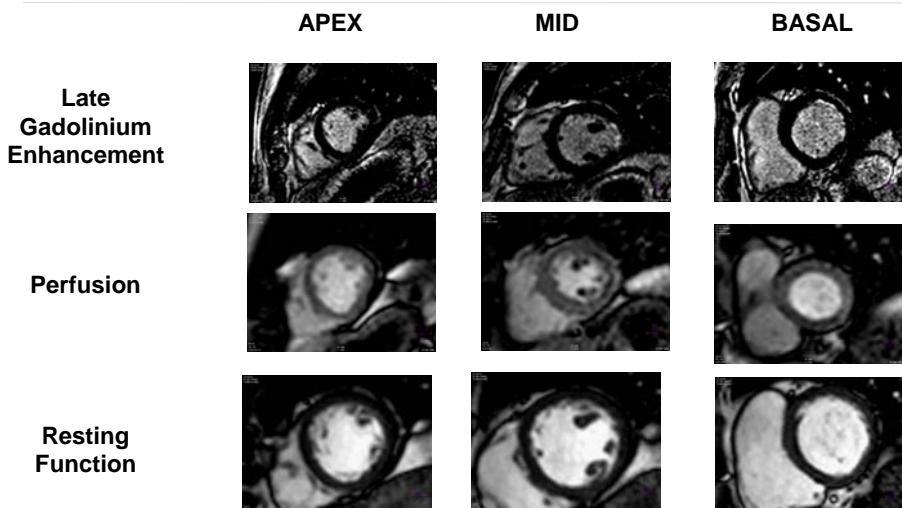


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CMR: Total IHD assessment in 30 minutes



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CT



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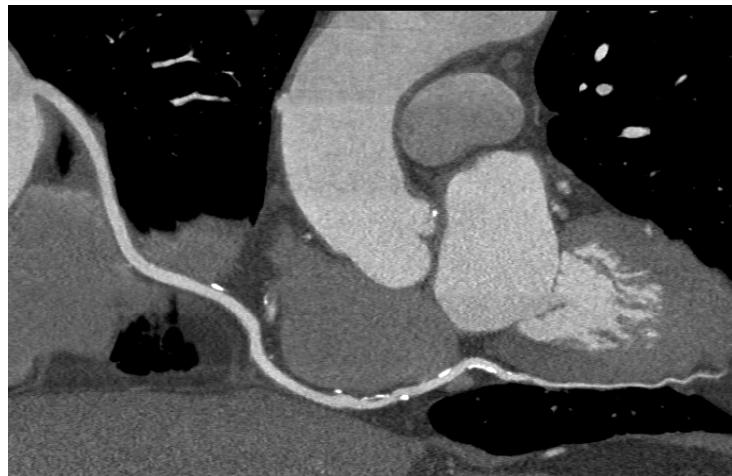
Cardiac CT

- *Fast*
- *Very good 'rule out' test*
- *Coronary arteries*
- *Identify components of lesions*

Cardiac CT – a Major Player

- *NICE Guidelines (UK 2010 CG 95)*
- *Treadmill tests no longer routinely used*
- *Low likelihood CAD – Cardiac CT*
- *Predicted surge in Cardiac CT requests*

Cardiac CT



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3D Echo



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3D Echo

- *Portable*
- *Fast*
- *Excellent for heart valves (particularly mitral)*

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3D Echo - Valves

2D



3D



Courtesy X Jeanrenaud, CHUV,
University Hospital, Lausanne

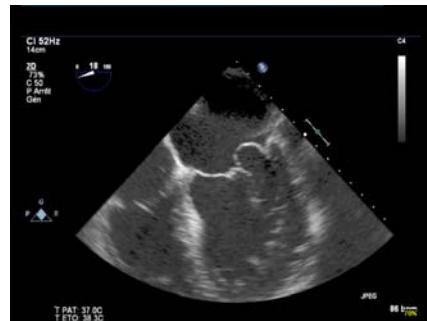
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3D Echo – Valves

2D



3D

Courtesy X Jeanrenaud, CHUV, University Hospital, Lausanne

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Conclusion

- *Background of non invasive cardiac Imaging*
- *Current Imaging*
- *The Future*

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Conclusion

- *CMR – Muscle*
- *CT – Arteries*
- *3D Echo – Valves*

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

