

Answers to the unanswered questions during the live

1. Are there any types of METALLIC prosthetic heart valves which preclude the advantages of Magnetic Resonance Imaging?

⇒ *In general, virtually all prosthetic heart valves (metallic and non-metallic) are considered safe for routine clinical 1.5 or 3-T field strength. Safety of specific models can always be confirmed at mrisafety.com. Some greater caution is warranted with very old models such as the Starr-Edwards ball & cage valve.*

2. Excluding expensive £ cost factors when is radiation risk of cardiac C.T. still preferable to M.R.?

⇒ *CT is preferred if coronary anatomy and plaque content needs to be defined rather than myocardial disease or ischemia.*

3. Under what circumstances would the Imaging quality of Echocardiography be clearer than c.M.R. & when to combine them?

⇒ *Echo is still the most readily available test. CMR often follows for tissue characterisation not possible with echo or if there are poor windows.*

4. What is the incidence of unexpected INCIDENTALOMAs appearing on c.M.R. & how to manage Rx them?

⇒ *A useful review for the cardiologist is provided by Rodrigues at al (2016) <https://jcmronline.biomedcentral.com/articles/10.1186/s12968-016-0246-1>*

5. How does cerebral deposition of gadolinium affect brain function? >Are there any other consequences?

⇒ *Although the deposition of Gadolinium in bone and brain tissue is now understood to be more common than researchers previously thought, the long-term consequence, if any are not understood - and this remains an area of active research, with appropriate advice likely to follow from responsible bodies.*

6. Are any types of Implantable Cardioverter Defibrillators at risk of being damaged by using Magnetic Resonance?
 - ⇒ *Provided the device is confirmed as MR safe/conditional and the manufacturers guidelines are followed with respect to protocol and SAR settings, there are no known issues.*

7. What is the rule of CMR in diagnosis of the origin of ventricular arrhythmias?
 - ⇒ *CMR can detect (or rule out) scar from MI or other process on LGE as the culprit. It can also detect ischemia. Newer T1 mapping techniques can also detect diffuse fibrosis. Moreover, it offers detailed assessment of any potential underlying cardiomyopathy or structural defect.*

8. Perfusion: CT vs cMR CT ionizing radiation vs gadolinium? Which is worse for the patient?
 - ⇒ *Adverse reactions from Gadolinium are exceptionally rare especially if withheld from patients with GFR<30 (as is the case in most centers). Radiation doses for CT perfusion are still very high for widespread first line use in my opinion - but has its role in difficult cases, and technological advances are likely to bring this down.*

9. Has looking for ischemia in patients with 'ischemic heart failure' i.e. based on visual coronary artery stenosis degree. Viability has been disappointing and the physiology in the failing heart may make vasodilatation (Adenosin) testing futile. Or not?
 - ⇒ *There has yet to be a large-scale prospective randomised viability trial using CMR - and this is a challenging study. CMR has a lot to add in ischemic cardiomyopathy - from diagnosis, stratification and prognostication. Adenosine stress testing can still be useful. Viability testing and the impact of the results should always be considered on an individual case basis.*

10. Do you think that q flow sequence could replace the information that give us the echo Doppler?
 - ⇒ *No not entirely. Echo is still the gold standard for valve disease quantitation and has many years of evidence base behind it. CMR is additive and can be useful in complex cases or congenital heart disease - however it can underestimate regurgitation if flow jets are complex or vortical for example.*

11. Is cmr the best modality of diagnosis in dressler's syndrom?

⇒ *This is often a clinical diagnosis - however it can be well-characterised by CMR.*

12. Can the cardiac hemodynamic parameters be actually replacing the invasive diagnostic approaches in heart failure patients?

⇒ *CMR parameters are additive to invasive. On an individual case basis, they may be sufficient to not require invasive testing.*

13. What is more cost effective then CMR or 4D flow for congenital anomalies?

⇒ *4D flow is a novel CMR sequence.*

14. How far is CMRI confirmative in diagnosing early regional wall motion abnormalities?

⇒ *CMR is the gold standard for wall-motion and LV volumes.*

15. Semiquantitative perfusion?

⇒ *This is readily available in most CMR post-processing suits. Based on calculating myocardial perfusion reserve index from the ration of tissue and bloodpool uplope. Predominantly a research tool.*

16. There are different websites dealing with MR-conditional devices. Some focus just on the magnetic field but not on the HF-conditions. - Witch website is the best?

⇒ www.mrisafety.com

17. CMR usage in early detection of systolic dysfunction

⇒ *CMR is the gold standard for wall-motion and LV volumes.*

18. Would you choose MR against CAT for coronary investigation?

⇒ *Stress CMR is the optimal technique for detecting myocardial ischemia. Coronary CT is the optimal technique for defining coronary anatomy and stenosis.*

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19. Is it useful in endocarditis?

⇒ *It can be eg for large vegetations, abscesses or if the etiology of a mass is uncertain. However, many vegetations are too small and too mobile for CMR, hence TTE/TEE is usually first-line.*

20. In your opinion-please list as follows 5 highest indications and contraindications for CMR

⇒ *Indications: stress perfusion, cardiomyopathy including myocarditis, mass, congenital heart disease including aortic disease, viability. Contraindications: claustrophobia, unsafe device or prosthesis, eye shrapnel, renal failure if contrast required.*

21. CMR vs CCT: cost-benefit radiation exposure functional significance vs anatomic lesions in CAD?

⇒ *Stress CMR is the optimal technique for detecting myocardial ischemia. Coronary CT is the optimal technique for defining coronary anatomy and stenosis. However, whether ischemia or anatomy is the best diagnostic endpoint is an ongoing debate.*

22. CMR between cardiologist and radiologist: where is the balance in everyday practice (in office)?

⇒ *Provided appropriate training and certification has been completed, the background of an individual is less relevant. Both specialties should work together and support reporting where feasible. Cardiologists often have strengths in putting results in clinical context; and radiologists usually have extensive technical knowledge, as well as offering interpretation of non-cardiac structures in the field of view.*

23. Controversies in clinical CMR?

⇒ *Wedge.*

24. Can we calculate pulmonary venous resistance (PVR) through CMR for hemodynamic studies or just Qp:Qs Ratio?

⇒ *Small studies, such as those by Swift et al have shown that PVR can be calculated - although this is not routine.*

25. How to calculate diastolic ventricular dysfunction vs small ventricular cavity?

⇒ *With similar timing or strain parameters as echo - particularly with tagged images or using feature-tracking software.*

26. Is there superiority for CMR over the Echocontrast myocardial perfusion study with new echocontrast materials?

⇒ *If acoustic windows are poor, contrast maybe sufficient to answer the clinical question particularly if related to wall-motion assessment. However, CMR offers an unrivalled field of view, assessment in any prescribed tissue plane and detailed tissue characterization.*

27. Could CMR quantify shunt in congenital cardiac diseases?

⇒ *Yes, this is a common application - using phase-contrast imaging sequences.*

28. Do you think CMR application in Left Atrium Function assessment in heart failure or stage B heart failure will be main stream?

⇒ *CMR is highly accurate for assessing left atrial volumes and there is some work showing promise for diastolic function assessment using strain, tagging and feature tracking - however, left atrial function is not a major clinical application of CMR currently.*

29. CMR in left atrium function? Any thoughts?

⇒ *CMR is highly accurate for assessing left atrial volumes and there is some work showing promise for diastolic function assessment using strain, tagging and feature tracking - however, left atrial function is not a major clinical application of CMR currently.*

30. Accuracy of MRI in quantification of regurgitant valvulopathies

⇒ *CMR is highly accurate in quantifying valvular regurgitation, but is generally considered additive to echo. It can underestimate regurgitation of jets are complex or vortical. It can also be more difficult to quantify with CMR when they are multiple valves with significant regurgitation.*