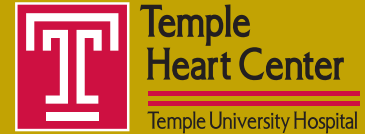


Cardiology and Radiology Announce Joint Advanced Cardiac Imaging Program



We are pleased to announce a joint collaborative program to provide advanced diagnostic cardiac imaging with Cardiac CT and MRI. Cardiology and Radiology have developed a multidisciplinary program that will enhance our ability to diagnose and provide direction in the management of complex coronary and structural heart disease.

In addition, the joint Advanced Imaging Program provides formal training to Radiology Residents and Cardiology Fellows in this emerging new imaging modality.

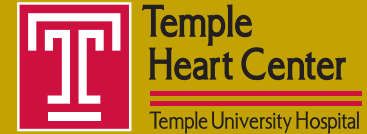
Q. What is “Advanced Cardiac Imaging”?

A. The standard cardiac imaging tests involved in echocardiography and nuclear cardiology have generated immense amounts of diagnostic and prognostic information for millions of patients over the past 40 years and have become a seamless part of cardiac care and decision making. There has been growing awareness through patient oriented outcomes research over the past ten years that, for select populations of cardiac patients, the advanced imaging modalities of Cardiac CT (CCT) and Cardiac MR (CMR) bring additive and complementary information in refining diagnosis and treatment plans. Many major clinical centers already have active programs in CCT and CMR. We look forward to bringing the power of such information to our patient population.

Q. Why a joint program?

A. Joint acquisition oversight and joint signatures on interpretative reports brings multidisciplinary expertise to the betterment of patient care and allows for high quality work that is technically good with reports clinically targeted to help in management decisions. It works to draw the technologists into the outcomes and improved image quality, creates a

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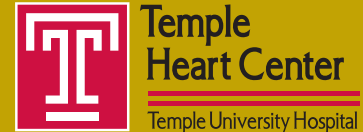
critical mass for overall quality improvement activities and clinical research trials, and creates multiple team members available to go over images and reports with clinical referring physicians. The joint teaching program will allow both radiology residents and cardiology fellows to develop expertise in these modalities to the future benefit of patients everywhere. A clinical physician should feel free to seek out either physician on a joint report for further clinical discussion.

Q. What is a Cardiac CT and how is it done?

A. Cardiac CT takes advantage of the rapidly progressing breakthrough in CT technology of the late 1990's. MDCT ("slices") uses multiple detectors, rather than one, to catch the X-Rays from a spinning X-ray generator. With the advent of 64 detectors (with more coming!), there is improved spatial resolution (about 0.6 – 0.7 mm which is vital for 2- 5 mm coronary arteries) and improved temporal resolution (330 msec). Since the heart is a "moving organ" and a picture must be "frozen" to not be fuzzy, this marked increase in temporal resolution has made this cardiac modality possible. The explosion in processing 3 – D software to match these acquisition possibilities allows thoughtful conclusions.

Despite the good temporal resolution, the coronary artery CT still needs slow heart rates to obtain the best pictures (about 50- 70 BPM). In this regard, the preparation for the acquisition of a quality study takes much longer than taking the picture itself. Since iodinated contrast (can not be allergic) is needed to follow blood vessels, a creatinine must be available and acceptable (less than 1.6). The patient will need to come an hour early and gentle additional IV beta blockade is frequently necessary as well as instruction in breathholding (for 12 seconds). SL NTG is frequently administered just prior to acquisition to "plump up" the coronaries. The patient is usually on the CT scanning table only around 10- 15 minutes and the picture session itself is only about 15 seconds during a breathhold. Obviously, an intense 15 seconds to get the best results.

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A “score” of the amount of calcium in the coronaries can also be obtained at this time. Calcified blood vessels are the sine quo non of atherosclerosis (although not necessarily reflecting anatomically critical atherosclerotic stenoses). The more calcium, the higher the atherosclerotic burden, and the more likely a cardiac event in the intermediate term.

The patient should expect to be in the testing area for up to 2- 2 ½ hours for the examination.

Q. What is Cardiac MR and How Is It Done?

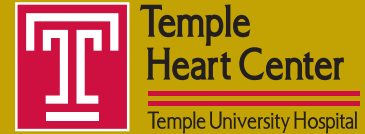
A. Cardiac MR utilizes the MR magnet and has been used clinically in cardiology for 20 years. In many ways, this modality functions as a “super echo/Doppler”. Similar Information can be obtained about chamber sizes, regional wall motion, LVEF, regurgitation and stenotic flows. Advantages include larger field of view of the chest, excellent image quality (picture signal is more robust than ultrasound), and the ability to take multiple views. Most importantly, the use of Gadolinium contrast (if renal function acceptable) for “Delayed Hyper Enhancement Images” (DHE) allows a specific form of data capture not currently available with any other cardiac imaging modality. As such, definition of coronary and non coronary scarring/fibrosis or infiltration can be sought and viability delineated. In this regard, CMR offers some distinctive advantages in the work-ups of cardiomyopathies.

The study is complex and will take 2 hours for patient to complete. Metallic devices (such as pacers/ICDs) would be a contraindication in the magnet and renal insufficiency creates problems for the use of gadolinium. Slower heart rates are also helpful for acquisition.

Q. Who is an appropriate patient for Cardiac CT?

A. “Appropriateness Criteria” for cardiac CT have been generated by 8 professional societies and published in Journal of the American College of Cardiology, Vol 48, No. 7, 2006. 13

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indications are deemed “appropriate” by the professional societies (see attachment) and there is now growing positive information on several of the “uncertain indications”. Pragmatically, the largest use nationally has been with “equivocal” stress tests that the clinician feels does not necessarily need to go to the cath lab.

Q. Who is an appropriate patient for Cardiac CT?

A. “Appropriateness criteria” for CMR were published in the same clinical appropriateness statement as cardiac CT. (see above reference and attachment). Seventeen indications were deemed “appropriate” and there is now growing positive evidence on several of the “uncertain indications”. Pragmatically, the largest use nationally has been the use of gadolinium imaging and the “delayed hyperenhancement phenomenon” to classify and risk stratify cardiomyopathies.

Q. How do I schedule a CCT or a CMR?

A. Scheduling can be accomplished through the Call Center at 215-707-5555. Renal function and allergies are questions that will be asked. Please do not hesitate to call or discuss cases prior or after acquisition with either Bill Van Decker, MD (beeper 2573 or email) or Bob Steiner, MD (beeper 215-691-0602). All feedback on this service is welcome as we work to provide high quality cutting edge CV Imaging to the organization.