Dear Readers,

This month’s letter is focused on the exciting new era of MRI imaging in the field of electrophysiology. Within the Device Therapy section of this issue, you will find an excellent manuscript titled “MRI Conditional Pacemakers: The Future Begins Here,” which originates from the Vanderbilt University Medical Center. In this article, Sabin and Clair describe the technical features of the new Revo MRI Pacemaker System and share their experiences in performing MRI studies for patients with this device. You will also find an accompanying commentary by our Device Therapy Section Editor following the manuscript that further highlights experiences with this technology. Not surprisingly, their results have been very satisfying.

It is really a shame that we have allowed “dogma” to discriminate against our pacemaker and ICD patients for so long in terms of access to critical MRI technology. Early reports of death were unfortunate in the MRI scanner from patients that were not known to have had a pacemaker or ICD (primarily from pre-1996 devices). There are certainly theoretical and potentially real risks involved with performing MRI studies for patients with an implanted pacemaker or ICD. For example, the following potential complications could occur:

- Movement of the device or lead(s)
- Temporary or permanent modification of the function of the device
- Inappropriate sensing, triggering or activation of the device (i.e., inhibition of pacing in a pacer dependent patient or inappropriate shocks)
- Excessive heating of the leads or induced currents in the leads

Indeed, many centers have now reported their experience in safely performing MRI studies in patients with pacemakers and ICDs from all manufacturers. A more enlightened set of recommendations was issued by the AHA in 2007, stating it is reasonable to perform MRI studies in non-pacemaker dependent patients if clinically indicated with special consent and appropriate monitoring.1

At the most recent Annual Scientific Sessions of the American Heart Association, we presented an oral abstract on one of the largest series of device patients to undergo MRI imaging.2 In this study, we presented the results of performing an MRI in 124 patients (87 pacemakers from four vendors, 36 ICDs from three vendors) between January 2006 and November 2011.

In this study, we used a 1.5 Tesla MRI with the minimal number of scanning sequences. We did not perform any diffusion scanning, and device interrogation was performed prior to and immediately following the MRI study. Pacemaker-dependent patients were programmed to asynchronous pacing, ICD patients had all tachyarrhythmia therapies turned off, and we did not perform an MRI study for any pacemaker-dependent ICD patients. During the MRI study, there was ongoing visual and verbal communication with each patient, and we utilized real time EKG, pulse oximetry, and blood pressure monitoring for all patients involved.

Of the 124 total patients in the study, we witnessed one 50 Ohm lead impedance rise, one patient with paroxysmal AF during the MRI, one patient with a wide complex tachycardia during the MRI study (which resulted in premature termination of the MRI), and one Biotronik pacemaker that became uncomfortably warm during the study. There were no deaths, device failures, loss of capture, electrical reset or clinically significant device programming changes observed.

Based upon the large number of patients, we concluded that MRI imaging of pacemakers and ICDs from all manufacturers was safe and could be performed, provided the above mentioned safety parameters were observed. Unfortunately, with the recent FDA approval of the Revo MRI Pacemaker System, Medicare is now denying reimbursement of MRI studies performed for pacemaker and ICD patients from other manufacturers. While our device patients can now safely undergo MRI scanning (with the appropriate safety measures in place), these patients are once
again being discriminated against — though this time it is not medical dogma but rather governmental public policy. It is my hope that as our collective knowledge on this topic grows; these policies will start to reflect our findings regarding MRI technology for patients with pacemakers and ICDs.

To switch gears a moment, I would like to provide an invitation to the complimentary online educational resource we have recently launched on the www.InnovationsInCRM.com website that will provide outstanding insight on management strategies for the atrial fibrillation patient.

These illustrative on-demand video presentations were produced directly from sessions at AF Ablation Innovations: Insights from the Experts, which was launched this past December in New York City. The presentations are comprised of illustrative lectures, debates, clinical decision making reviews and accompanying panel discussions by the expert faculty. Information on the 2012 AF Ablation Innovations course will be available shortly on the conference website, www.AfibInnovations.com, along with our homepage, www.InnovationsInCRM.com.

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