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SAFETY OUTCOMES IN PATIENTS WITH IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS AND PERMANENT PACEMAKERS UNDERGOING MAGNETIC RESONANCE IMAGING AT 1.5-TESLA

ACC Poster Contributions
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Background: Historically, magnetic resonance imaging (MRI) has been contraindicated in patients with permanent pacemakers (PPMs) and implantable cardioverter-defibrillators (ICDs). However, modern devices have more electromagnetic interference protection. The purpose of our study was to evaluate clinical outcomes and device measurements in patients with PPMs and ICDs undergoing 1.5-Tesla MRI.

Methods: We conducted a retrospective chart review on 86 MRI exams in subjects with PPMs or ICDs at our institution between July 2005 and February 2009. All patients were non-pacemaker-dependent. Interrogations of the device for each patient occurred before MRI, immediately after MRI, and at follow-up visits. Mean follow-up office visit was 6.4 months. Forty-seven ICDs and thirty-nine pacemakers underwent MRI exams. Statistical analysis used non-parametric methodology.

Results: There were no adverse clinical sequelae after MRI in patients with PPMs or ICDs. Comparing all devices, atrial sensing thresholds differed (2.79mV vs 2.43mV) from pre-MRI to follow up testing (p= .024). No change in ventricular measurements was seen. In pacemakers alone, there was no change in atrial or ventricular measurements. In ICD's, a difference was observed (p=.036) between atrial sense thresholds from pre-MRI to office follow-up (2.93mV vs 2.88mV). Ventricular pacing impedances differed (p=.037) between pre and post-MRI values in ICD's (533.3 ohms vs 548.2 ohms). A difference (p=.037) was seen in atrial pacing impedances for devices that had more leads present (ie- three leads vs one lead). Analysis of patients undergoing cardiac MRI vs non-cardiac MRI showed a difference (p=.007) in battery voltage usage between groups.

Conclusions: MRI performed in a select group of non-pacemaker-dependent patients with PPMs or ICDs showed no adverse clinical sequelae during initial testing and over a mean follow-up period of 6.4 months. There was no oversensing of electromagnetic interference with any device. The absence of negative outcomes was found despite occasional threshold differences between subject groups.