



## Is a Change in Cardiac Device Lead Impedance After Magnetic Resonance Imaging at 1.5 Tesla Associated With Other Parameter Changes?: Preliminary Results from The MagnaSafe Registry

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### *Abstract:*

**Introduction:** The MagnaSafe Registry is a multicenter prospective study designed to determine the risk of MRI at 1.5T in 1500 patients with pacemakers (PM) and implantable cardioverter-defibrillators (ICD) who undergo clinically indicated non-thoracic imaging.

**Methods:** Device interrogation was performed pre- and post-MRI using a standardized protocol. Primary endpoints were device failure, generator/lead replacement, induced arrhythmia, loss of capture, or electrical reset. Secondary endpoints were clinically relevant device parameter changes.

**Results:** As of October 2012, 829 non-thoracic MRI studies were performed (617 PM, 212 ICD, 1620 leads) at 16 clinical sites. No primary events occurred. A change in atrial and ventricular pacing lead impedance of  $\geq 50\Omega$  occurred in 3% of PMs and 4% of ICDs. In 9 PM cases with an impedance increase  $\geq 50\Omega$ , 1 (11%) had an additional change event, while in 29 cases with an impedance decrease  $\geq 50\Omega$ , 5 (17%) had an additional change event. An impedance change (increase or decrease) of any amount was noted in 75% of atrial leads and 80% of ventricular pacing leads. For atrial leads, an increase in impedance of any amount was noted in 19% and a decrease in 56%. For ventricular leads, an increase in impedance of any amount was noted in 22% and a decrease in 58%. A change in pacing lead impedance was not associated with changes in P wave voltage, atrial pacing threshold or body mass index. In addition, impedance change did not correlate with right ventricular (RV) pacing lead age. Although atrial impedance change was negatively associated with lead age ( $P=0.047$ ), and RV impedance change was negatively associated with RV threshold change ( $P=0.003$ ) and positively associated with R-wave voltage change ( $P=0.003$ ), each statistically significant association explained only 1% of the variation in lead impedance change ( $r^2$  values of 0.01, 0.01, and 0.01, respectively).

**Conclusions:** Preliminary results for the first 829 cases in MagnaSafe demonstrate no device failure, generator/lead replacement, induced arrhythmia, or loss of capture during non-thoracic MRI at 1.5T. Impedance change was not associated with secondary changes in atrial or ventricular pacing thresholds, or measured P/R wave voltages.