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Magnetic resonance imaging safety in patients with cardiac implantable electronic devices - current status

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Introduction: The MagnaSafe study and others established the safety of MRI scanning of patients implanted with legacy CIEDs. Limitations of devices categorized as MRI conditional have not been systematically reviewed.

Methods: Patients with CIEDs referred to undergo MRI scanning at the Mor-Mar Medical Diagnostic Imaging were included. Current guidelines were followed during the scans. All CIEDs were examined prior to and post each scan. Reprogramming was done as necessary. Qualified personnel monitored each patient during the course of the scan. Limitations on MRI performance and changes in device function were noted.

Results: From 2014-2018 280 patients with CIEDS underwent MRI scanning at Mor Mar. No adverse outcomes were noted for any patient and only two were excluded- one with a Lumax 540 device incapable of forced pacing and one patient with a damaged atrial lead. For patients with legacy devices there were no limitations in performance of the scan and no acute changes in device function. However for MRI conditional devices the following limitations were noted: the length of scans was limited to 30 minutes in St Jude and Biotronic devices. Boston Scientific MRI conditional ICDs lost their ability to perform audible alerts. One St Jude ICD transiently failed to measure battery voltage for several days.

Conclusions: MRI can be performed safely in patients with CIEDS with proper surveillance. Paradoxically, some features MRI conditional devices may be transiently or permanently damaged by these scans and scanning conditions may be limited. Personnel implanting CIEDS patients should be aware of these issues.