

Date: February 1st 2021

**Canadian Heart Rhythm Society
Device Committee**

**RE: Electromagnetic Interference (EMI) from Mobile Phones and Other
Accessories with Incorporated Magnets**

Nature of the problem:

A recent case report, published in the Heart Rhythm Journal describes a patient with an implantable cardiac defibrillator (ICD) that was temporarily deactivated when an iPhone 12 was placed over the device (<https://doi.org/10.1016/j.hrthm.2020.12.032>). This case report has generated new concerns regarding potential electromagnetic interference (EMI) from mobile phones and other smart accessories.

Scope of the problem:

The new generation iPhone 12 has a circular array of magnets around a central charging coil in the back of the phone. This allows for compatibility with “MagSafe” accessories to allow for wireless charging of the phone. This technology has been used in other mobile phones to allow wireless charging, but the iPhone 12 generation has a more powerful magnet to allow for faster charging (up to 15 Watts) and compatibility with other MagSafe accessories (cases, wallets, etc.).

This is the first case report of a significant interaction between this iPhone generation and an ICD, with the potential for undelivered therapies when the phone is in close proximity to the ICD. Although not described in the case report a similar interaction with a pacemaker would be expected to force asynchronous pacing (VOO or DOO).

Similar interference with the performance of cardiac implantable electronic devices (CIED) has previously been described with magnet cases used with iPads, fitness tracker wristbands and smartwatches. This is a timely reminder that EMI is possible with a wide variety of commonly used electronic devices. The potential for EMI is in direct relationship to the power of the magnet and the distance from the implanted device. Some CIED manufacturers have recommended patients maintain a 15 cm (6 inches) distance from their CIED at all times.

Response of the CHRS Device Committee:

- Special attention should be made to inform patients with CIEDs that the new generation iPhone 12 has a more powerful magnet, and that interference could be seen when the mobile phone is in close proximity to their implanted device. This could result in temporary “suspended mode” for an ICD with the inability to deliver therapy or asynchronous pacing for a pacemaker. Thus:
 - CIED manufacturers recommend that patients maintain a 15 cm (6 inch) distance from their CIED at all times to avoid issues with magnets.
 - When the mobile phone is wirelessly charging (connected to the MagSafe charger), Apple™ recommends increasing the distance to 30 cm (12 inch).
- This should be a reminder to all patients and CIED clinicians that any mobile phone or accessory equipped with a magnet are potentially capable of EMI when in close proximity to a CIED.
- The CHRS device committee may update these recommendations should more data become available.

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