

Patient Safety Tip of the Week

July 20, 2021

FDA Warning: Magnets in Consumer Electronics May Affect Medical Devices

The FDA has raised concerns that magnets in some consumer electronics, such as cell phones and smartwatch wristbands, may affect pacemakers, implantable defibrillators, and other medical devices ([FDA 2021a](#)). The FDA states “We believe the risk to patients is low and the agency is not aware of any adverse events associated with this issue at this time. However, the number of consumer electronics with strong magnets is expected to increase over time. Therefore, we recommend people with implanted medical devices talk with their health care provider to ensure they understand this potential risk and the proper techniques for safe use.”

Many medical devices are designed with a “magnet mode” to allow for safe operation during certain medical procedures, such as undergoing an MRI scan. These safety features are typically initiated with the use of a high field strength magnet that is placed near the implanted device placing it into a “magnet mode.” But there have been recent case reports where magnets in certain cell phones or smartwatches or fitness bands have deactivated devices such as implantable cardioverter-defibrillators (ICD’s).

The FDA also provides information for patients on this issue ([FDA 2021b](#)), stating “People with implanted medical devices may want to take some simple precautions, including:

- Keep the consumer electronics, such as certain cell phones and smart watches, six inches away from implanted medical devices.
- Do not carry consumer electronics in a pocket over the medical device.
- Check your device using your home monitoring system, if you have one.
- Talk to your health care provider if you are experiencing any symptoms or have questions regarding magnets in consumer electronics and implanted medical devices.”

The FDA patient advisory goes on to say that, when near high strength magnets, devices with a magnetic safe mode could stop working or change how the device works. An example is that a cardiac defibrillator may be unable to detect tachycardia events, or it

may change the operational mode of the devices such as turning on asynchronous (i.e., two or more events not happening at the same time) mode in a pacemaker.

FDA emphasizes the following for patients: “to avoid interference between cell phones and smart watches and your heart device, keep them at least six inches (15 centimeters) away from implanted medical devices. Also, do not place cell phones, smart watches, and other consumer electronics close to your implanted medical device.”

Based on concerns that the new magnet in the iPhone 12 with MagSafe compatible cases might affect implantable cardioverter-defibrillators (ICD's), researchers at Henry Ford Heart & Vascular Institute tested the hypothesis on a patient with a Medtronic ICD ([Greenberg 2021](#)). Once the iPhone was brought close to the ICD over the left chest area, immediate suspension of ICD therapies was noted and persisted for the duration of the test. This result was reproduced multiple times with different positions of the phone over the pocket.

Asher et al. ([Asher 2021](#)) found that a patient's ICD had reverted to magnet mode after she slept wearing an Apple Watch. They subsequently conducted tests and found both Fitbit and Apple Watch wristband magnets could deactivate the ICD up to distances of 2.4 and 2.0 centimeters, respectively.

Apple recently published a list of its devices that patients should keep away from their pacemaker or other medical devices ([Apple 2021](#)). It is surprising how many Apple products have magnets. The list includes not only the iPhone 12 and its MagSafe accessories, but also Apple Watches, AirPods and their charging cases, various iPads, Beats, various Mac models and accessories, and HomePods.

Apple notes “Under certain conditions, magnets and electromagnetic fields might interfere with medical devices. For example, implanted pacemakers and defibrillators might contain sensors that respond to magnets and radios when in close contact. To avoid any potential interactions with these types of medical devices, keep your Apple product a safe distance away from your medical device (more than 6 inches / 15 cm apart or more than 12 inches / 30 cm apart if wirelessly charging). Consult with your physician and your device manufacturer for specific guidelines. If you suspect that your Apple product is interfering with your medical device, stop using your Apple product and consult your physician and your medical-device manufacturer.”

More and more consumer electronic products are using magnets and it is not always obvious to people that their device has a magnet that could potentially interfere with a medical device.

While the FDA advisory says it believes “the risk to patients is low and the agency is not aware of any adverse events associated with this issue at this time”, we found the case described by Asher et al. ([Asher 2021](#)) to be particularly bothersome. That case involved a 55-year-old woman with a dual-chamber ICD because of a history of sustained ventricular tachycardia secondary to arrhythmogenic right ventricular dysplasia. Because

of a recommendation to avoid strenuous exercise, she purchased an Apple Watch with fitness tracking capabilities to monitor her heart rate. She sometimes wore the watch overnight. While asleep one night, she was awoken by several beeps emanating from her implanted cardiac device. Subsequent interrogation of the device showed no alerts or abnormal parameters, but it was found that the device had reverted to magnet mode, owing to magnetic interference from the fitness watch's wristband. No other possible sources of interference were identified. This was replicated in the office, where interrogation of the ICD confirmed magnetic reversion when placed in proximity to the wristband. The watch itself did not have magnetic interference.

Had not that patient heard the beeps from her ICD, she might not have realized her ICD would not be active if she had an episode of ventricular tachycardia. Pretty scary!

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