iPods and similar devices found not to affect pacemaker function

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Last May, a widely reported study concluded that errant electronic noise from iPods can cause implantable cardiac pacemakers to malfunction. This just didn't sound right to the cardiac electrophysiologists at Children's Hospital Boston, who've seen hundreds of children, teens and young adults with heart conditions requiring pacemakers.

"Many of our pacemaker patients have iPods and other digital music players, and we've never seen any problem," says Charles Berul, MD, director of the Pacemaker Service at Children's. "But kids and parents bring up this concern all the time, prompting us to do our own study."

Between September and December, 2007, Gregory Webster, MD, a cardiac fellow in training at Children's, along with the electrophysiology nurses and physicians, ran tests on 51 patients coming in for appointments. Whereas last year's study was done in patients averaging 77 years of age, the average age in the Children's study was 22 (ranging from 6 to 60). All patients had active pacemakers or implantable cardioverter-defibrillators (ICDs), which were tested against four digital music players – two kinds of iPods (Apple Nano and Apple Video), SanDisk Sansa and Microsoft Zune. All patients were lying down during the tests (in case an arrhythmia occurred, causing them to faint), and each digital player was placed directly over the pacemaker or ICD.

As reported in the April 2008 issue of the journal Heart Rhythm, accompanied by an editorial, there was no interference with intrinsic device functioning – patients' EKG (electrocardiographic) recordings

showed no change in any of 255 separate tests, and no patients had symptoms. "This provides reassuring evidence that should allay the fears of people using iPods and other digital music players," says Berul, the study's senior investigator.

However, in 41 percent of patients, the music players interfered with telemetry, or communications between the programmer and the pacemaker or ICD itself. (The programmer is a computerized device used by physicians to check and recalibrate the pacemaker/ICD – patients do not carry it.) This interference, picked up in 29 of 204 tests, went away when the digital player was moved six inches or more from the device, and did not compromise device function. The larger digital players (Zune and Apple Video) caused more interference with telemetry than the small players.

Patients should not use digital music players while the doctor is trying to reprogram their device, Webster and the electrophysiology team conclude. "If the iPod is right in the field, the programmer might not be able to communicate with the pacemaker or ICD effectively," Webster says.

The findings of interference with the pacemaker itself, reported last May, are published and updated in the same issue of Heart Rhythm. The editorial discusses possible reasons for the discrepancy between the two studies, which mainly relate to the testing methods and interpretation of the pacemaker recordings. Importantly, the music players did not stop pacemakers from pacing (regulating the heartbeat) in either the Children's study or the previously reported study, though the previous study did find interference with pacemaker sensing.

Berul and colleagues are reassured by their own findings, but acknowledge that their testing was only short-term. "We can't conclude that it's completely safe to have an iPod right on top of the device for

hours at a time," Berul says. "That's why we suggest the precaution of keeping it at least six inches away."

Source: Children's Hospital Boston