

Normal headphone use unlikely to interfere with settings of programmable shunt valves

July 7 2015

Researchers at Brown University examined three magnetically programmable shunt valves to see if the magnetic field emissions of headphones can cause unintentional changes in shunt valve settings. Based on their findings, the researchers state that it is highly unlikely that commercially available headphones will interfere with programmable shunt valve settings. Full details of this study can be found in "Programmable shunts and headphones: Are they safe together?" by Heather S. Spader, MD, and colleagues, published today online, ahead of print, in the *Journal of Neurosurgery: Pediatrics*.

A variety of everyday objects emit electromagnetic fields that can potentially affect magnetically programmable shunt [valve](#) settings if brought too close to the valve. Examples include the iPad 2 and household magnets such as those found in refrigerator doors. Patients need to keep a safe distance between their heads and these objects. As far as the authors know, there has been no study to determine whether [headphones](#) affect magnetically programmable shunt valve settings. Given that the wearing of headphones has become ubiquitous and headphones are placed quite near the location of most shunt valves, Dr. Spader and colleagues decided to test whether potential problems may exist.

The researchers used three programmable shunt valves that are widely used to treat hydrocephalus (the Codman Hakim programmable valve, Medtronic Strata II valve, and Aesculap proGAV) to test the effects of three popular headphones (Apple earbuds, Beats by Dr. Dre, and Bose

QuietComfort Acoustic Noise Cancelling headphones). Electromagnetic field emissions from the headphones were examined using a direct-current gaussmeter. The researchers measured electromagnetic field emissions at distances ranging from 0 to 50 mm away from the headphones. All measurements were taken three times, and the mean emissions detected at the various distances were recorded. The gaussmeter detected high magnetic field emissions at 0 mm, but the emission levels dropped down quickly as the gaussmeter was moved away from the headphones.

To determine what effect headphones would have on programmable valve settings, the researchers set up each valve 0, 5, 10, 15, 20, and 50 mm away from each headphone. When there was direct contact between the headphone and valve (0 mm), the [magnetic field](#) strength of all earphones was sufficient to change the settings of the Codman Hakim and Medtronic Strata II valves. At distances of 5 mm or greater, however, no changes in valve settings occurred. Settings on the Aesculap proGAV valve were unaffected by all headphones at all distances tested.

Based on their findings, the researchers state: "Neurosurgeons should be aware that the potential for shunt reprogramming in patients using headphones is remote unless a headphone is in direct contact with a programmable shunt valve or there is tangential movement of a headphone around a valve. . . . Shunts are more likely to fail from obstruction, infection, or valve failure than from reprogramming from magnets."

When asked whether the authors were surprised about the results of their study, Dr. Spader said, "Given the published risk of iPads and programmable shunts, we were worried that headphones could have a similar effect. We were surprised to find that headphones are unlikely to reprogram shunts." Despite the strong findings, Dr. Spader adds, "Given the limitations of our study, we think that the public should be aware that

there are magnets in headphones and there could still be some adverse interaction."

More information: Spader HS, Ratanaprasatporn L, Morrison JF, Grossberg JA, Cosgrove GR. Programmable shunts and headphones: Are they safe together? *Journal of Neurosurgery: Pediatrics*, published online, ahead of print, July 7, 2015; [DOI: 10.3171/2015.1.PEDS14400](https://doi.org/10.3171/2015.1.PEDS14400)

Provided by Journal of Neurosurgery

Citation: Normal headphone use unlikely to interfere with settings of programmable shunt valves (2015, July 7) retrieved 26 April 2024 from <https://medicalxpress.com/news/2015-07-headphone-programmable-shunt-valves.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.