

Software downloaded during office visits could cut risk of ICD shocks

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Software downloaded during a routine office visit cuts the risk of inappropriate shocks by 50 percent for patients with implantable cardioverter defibrillators (ICD), according to research reported in *Circulation: Journal of the American Heart Association*.

"Hundreds of patients have been saved from unnecessary shocks by software that is safe and can be painlessly downloaded in one minute during a standard [defibrillator](#) check," said Charles D. Swerdlow, M.D., lead author of the study and a cardiac electrophysiologist at the Cedars Sinai Heart Institute in Los Angeles and Clinical Professor of Medicine at the University of California, Los Angeles.

Implanted defibrillators monitor the heart's electrical activity and deliver a shock to reset the heart to a normal rhythm if the pulse becomes too rapid and unable to sustain life. But if the lead wires that connect the device to the [heart muscle](#) break, the defibrillator may interpret rapid electrical signals caused by the fracture as coming from the heart — delivering one or more unnecessary and often painful shocks, Swerdlow said.

Although all leads can fracture, the most widely sold model — the Sprint Fidelis, used with many different defibrillator designs and removed from the market in October 2007 — had a much higher rate of breaks and inappropriate shocks. Downloadable Lead Integrity Alert (LIA) software monitors Fidelis leads for evidence of suspicious [electrical signals](#), alerting the patient and recalibrating the device to make a shock less

likely if a fracture is suspected, Swerdlow said.

"You don't wait to upgrade your operating system until you buy a new home computer, but prior to this people only got new software for defibrillators when the batteries ran low and they underwent surgery to implant a new device," Swerdlow said.

In the prospective study, researchers compared the experience of patients prior to their undergoing surgery to replace fractured leads, including 213 who had received standard daily monitoring and 213 monitored with the addition of the downloadable LIA.

The researchers found:

- One or more inappropriate shocks were delivered to 70 percent of the patients who received standard monitoring, but only 38 percent of the patients with LIA (a 46 percent reduction in risk).
- Five or more inappropriate shocks were delivered to 50 percent of the patients who received standard monitoring, but only 25 percent of patients with LIA (a 50 percent reduction in risk).
- 72 percent of patients with LIA had no inappropriate shock, or had at least three days warning prior to an inappropriate shock, whereas this was observed in only 50 percent of those who received standard monitoring.

"One year after LIA was released for download by physicians into patients' ICDs, 30 percent of patients undergoing remote monitoring had not had the software downloaded," Swerdlow said. "If your doctor hasn't done it yet, it can still be downloaded safely and painlessly."

The study is the first to demonstrate that the downloadable LIA software dramatically decreases the chance of unnecessary shocks in real patients. The results reveal the possibility of making other improvements to devices while they're implanted, researchers said.

About 114,000 inpatient implantable defibrillators procedures were performed in 2006 in the United States, according to the American Heart Association.

More information: Implantable Cardioverter Defibrillator (ICD) Animation - www.americanheart.org/presenter.jsp?identifier=3057242

Provided by American Heart Association

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