

Swimming pools may pose hazard for people with heart devices

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Electricity from pools' lighting systems might interfere with implanted defibrillators, case studies show.

(HealthDay)—With summer approaching, researchers caution that swimming pools may pose a risk to patients with irregular heartbeats who've received implantable defibrillators.

The issue: a danger that electrical currents linked to standard pool utilities such as lighting may "leak," causing a defibrillator to misread the status of a patient's heart.

Implanted cardioverter defibrillators continuously monitor and control a patient's heart rhythm.

"How common this is, we don't know," said Dr. John Day, second vice

president of the Heart Rhythm Society, a group representing arrhythmia specialists. "It's quite possible that there's underreporting going on, because when we see [patients](#) and we see noise recorded on their device we can't account for where it's coming from."

The concern stems from a few recent incidents that have been documented. In two cases, people with defibrillators experienced device misreadings while in a private family or hotel pool, and in another two cases, people experienced unwarranted shocks from their defibrillators while in public pools.

The cases all involved younger arrhythmia patients between the ages of 8 and 23. However, the investigators said there's no reason to believe that patients of all ages would not face a similar risk if they had such devices.

"I don't want to be an alarmist, because I do think we would have heard about this sort of thing happening much more often than we have if it were a really widespread problem," said study lead author Dr. Daniel Shmorhun, a pediatric cardiologist-electrophysiologist with Children's Cardiology Associates, an affiliate of the Dell Children's Medical Center of Central Texas in Austin.

"The nice thing about defibrillators is that they put a time-stamp on all activity," he noted. "So we were able to ask questions and delve into this after two patients came in with [interference](#) noise on their devices. And we found that both had been in pools at the time their defibrillators read the interference."

Shmorhun and co-author Dr. Arnold Fenrich are slated to present their findings at the Heart Rhythm Society meeting taking place this week in Denver. Findings presented at medical meetings are typically considered preliminary until published in a peer-reviewed journal.

Arrhythmia is a chronic condition in which the heart's electrical system has the potential to go awry—on occasion beating too fast, too slow, or irregularly. While many instances of arrhythmia pose little harm, severe cases can be life-threatening.

For such patients, implanted defibrillators can be life-savers, continuously surveying a patient's heartbeat for signs of trouble and instantaneously correcting for problems as they arise by sending out a corrective electrical pulse.

In the new study, Shmorhun and Fenrich reviewed the cases of two female patients (one aged 8 years and one aged 23 years), in which their defibrillators registered so-called "noise reversions" directly linked to time spent in [swimming pools](#).

In each case their devices picked up the reversion, classified it as an outside interference, reverted to a mode that actively ignored noise, and thereby prevented any accidental shock.

After the lighting system was repaired in the family pool in which the 8-year-old had swam, the girl did not experience any further defibrillator trouble, the researchers said. The older patient, however, simply decided to no longer use public pools, and has experienced no further problems.

Others were not so lucky. For example, in the past year a 21-year-old male—a competitive college swimmer and lifeguard—experienced not one but two shocks while swimming in a public pool. "He remembers that he had his back against the pool wall, quite close to lights in water," said Shmorhun. "And as he was moving away from the light he got shocked."

Shmorhun and Fenrich believe that low-level [electrical current](#) leaking from swimming pool wiring might be an "underappreciated cause" of

unwarranted defibrillator shocks.

"Water is an attractive source for electrical activity," Shmorhun explained. "We don't think there would be an issue at all in, say, the ocean or bay. But in a pool, where you have wires coming into the water from the outside, from the house, from an aging utility system, or an improperly grounded system, there is a potential for this kind of problem. Or if a pool is not properly bonded—meaning the pool circumference is not intact—there could be a problem," he noted.

"I'm not sure anybody can really predict up front what pools are an issue, and there's no practical means by which to easily test pools for this," Shmorhun added. "At the same time, we don't know the overall incidence, although three cases in the Austin area in one year seems like a lot to me. But at minimum, [defibrillator] patients need to be counseled about the risk."

For his part, Heart Rhythm Society vice president Day said the finding should not deter patients from swimming.

"We want our cardiac patients to be physically active. We don't want to restrain them and we don't want to create alarm," Day said.

"But in each of these cases we had these underwater pool lights that had an alternating current pool leak that could trigger a shock," noted Day, who is also director of Heart Rhythm Services at Intermountain Medical Center in Murray, Utah. "So, I think we certainly need pool safety. And clinically this is just one more thing that should be considered as a potential source of a problem for any patient with an implantable [defibrillator](#)."

More information: Find out more about heart arrhythmias at the [U.S. National Heart, Lung, and Blood Institute](#).

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