

# Real-time radiation monitor can reduce radiation exposure for medical workers

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It's a sound that saves. A "real-time" radiation monitor that alerts by beeping in response to radiation exposure during cardiac-catheterization procedures significantly reduces the amount of exposure that medical workers receive, UT Southwestern Medical Center researchers found.

In a randomized study, the researchers divided 505 patients undergoing either diagnostic coronary angiography or [percutaneous coronary intervention](#), such as stent placement, into two groups. In half the procedures, medical workers used the current gold standard for [radiation](#) monitoring, which is a "dosimetry" badge that is worn by a medical worker for a month and then sent off for the cumulative radiation dose to be read. In the other half, medical workers wore a device called Bleeper Sv, which beeps approximately once every 15 minutes in response to low background radiation, and beeps once every 20 seconds when exposure is higher, or continuously, if it is very high.

In settings where the medical workers wore the device that gives the real-time auditory feedback, radiation exposure was consistently decreased by approximately one-third.

"Radiation is invisible," said Dr. Emmanouil Brilakis, Associate Professor of Internal Medicine at UT Southwestern and senior author of the paper. "Use of a radiation detection device can provide real-time 'visualization' of radiation exposure, enabling operators to take actions to reduce radiation exposure."

Among actions that medical workers can take to reduce radiation exposure are reducing the frame rate (the number of X-ray images taken per second to create a "movie" of the coronary arteries), decreasing fluoroscopy time, repositioning the patient, repositioning the medical worker, adjusting the position of the radiation shield, and using additional shielding.

"Using devices that provide real-time [radiation-exposure](#) feedback can help the operator adopt safer radiation practices," said Dr. Brilakis, who is also Director of the Cardiac Catheterization Laboratories at the VA North Texas Health Care System. "In our study, this was achieved in a real-life setting among unselected patients using a low-cost device that can be used with any X-ray system."

Physicians and other [medical workers](#) on cardiac-catheterization teams will likely participate in hundreds of procedures a year. The dose limit for occupational exposure is 20 mSv per year for five years, but no dose is safe and all doses are considered to contribute to cancer risk.

"It has been shown that people who are chronically exposed to radiation in cardiac catheterization labs are more likely to develop left-sided brain tumors," said Dr. Brilakis. "The reduction in operator exposure observed in our study is likely to translate into a decreased risk for long-term adverse clinical events."

The results of the RadiCure study appear in the Dec. 16 issue of *Circulation: Cardiovascular Interventions*.

Other UT Southwestern researchers involved in this study are Dr. Anna Kotsia, Postdoctoral Researcher; Bavana V. Rangan, Research Scientist; Michele Roesle, RN; Dr. Atif Mohammad, Senior Research Associate; and Dr. Subhash Banerjee, Associate Professor of Internal Medicine.

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Provided by UT Southwestern Medical Center

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