

Lifetime cancer risk from heart imaging tests is low for most children

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Radiation from standard X-rays is relatively low and doesn't significantly raise lifetime cancer risks for most young children, according to research in the American Heart Association journal *Circulation*.

Researchers followed 337 children under age 6 who had surgery for heart disease at Duke University Medical Center in Durham, N.C. Their operations required almost 14,000 imaging procedures, including X-rays, computed tomography (CT) scans, and cardiac catheterization procedures using video X-rays called fluoroscopies.

The study is the first in which researchers quantified cumulative [radiation](#) doses in child heart patients and predicted lifetime cancer risks based on the types of exposures.

Researchers found that for the average child in the study, the cumulative effective dose of ionizing radiation was relatively low—less than the annual background exposure in the United States. However, some children with complex heart disease can be exposed to large cumulative doses that increase the estimated lifetime risk of cancer up to 6.5 percent above baseline.

"There are definitely times when radiation is necessary," said Kevin Hill, M.D., M.S., study lead author and cardiologist and assistant professor of pediatrics in the cardiology division at Duke. "But it's important for parents to ask and compare in case you can avert potentially high exposure procedures. Often, there are alternative or modified procedures

with less radiation, or imaging may not actually be necessary." The study found:

- Lifetime [cancer risk](#) increases ranged from 0.002 percent for chest X-rays to 0.4 percent for complex CT scans and cardiac catheterizations.
- X-rays accounted for 92 percent of imaging exams.
- Cardiac catheterizations and CT scans accounted for 81 percent of overall radiation exposure.
- Girls have double the cancer risks of boys because they're more prone to breast and thyroid cancers.

Cancer risks would be the same for any same-age child exposed to the same radiation levels, whether or not they had heart disease, Hill said. His team studied children with [heart disease](#) because they're exposed to more imaging studies than most groups.

Researchers reviewed medical records to find the most common imaging procedures, calculated how much radiation organs absorb during each procedure, then used a National Academy of Sciences report to analyze lifetime cancer risks based on the amounts of each procedure's exposure.

"Simple awareness is one of the greatest means to reducing exposure," Hill said. "Healthcare providers should consider tweaking protocols to limit radiation doses and balance risks and benefits of every imaging study they do."

Provided by American Heart Association

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