CT Scans Could Result in 103,000 Future Cancers

But some radiation experts counter that CT scans are directly linked to lower mortality rates and fewer invasive surgeries.

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In 2023, approximately 62 million people underwent computerized tomography (CT) scans in the United States. The radiation from the scans that year could result in 103,000 future cancers, according to study findings published in JAMA International medicine.

Radiation is a known carcinogen, but this study predicts a higher number of cases than previously expected.

This does not mean that CT scans should be avoided, cautioned the American College of Radiology (ACR) in a statement responding to the JAMA study. “Medical imaging exams—including CT—are a primary factor in declining cancer death rates and are directly linked to decreased hospital mortality rates and greater life expectancy. Scans reduce invasive surgeries, unnecessary hospital admissions and length of hospital stays,” wrote the ACR. “There are no published studies directly linking CT scans (even multiple CT scans) to cancer,” continued the statement, noting that the results of the JAMA study are based on theoretical radiation risk.

A CT scan is a noninvasive diagnostic imaging procedure that uses a combination of X-rays and computer technology to produce images of the inside of the body. CT scans are particularly useful for diagnosing and staging cancer because they can help identify tumors and guide treatment plans.

For the study, researchers looked at 93 million CT exams performed on 62 million people in 2023. They predicted that nearly 103,000 radiation-induced cancers would result from those scans. The risks were higher among children and adolescents, but the fact that more adults are getting CT scans accounted for about 91% of radiation-induced cancers.

“If current practices persist, CT-associated cancer could eventually account for 5% of all new cancer diagnoses annually,” the authors wrote.

Older projections published in 2009 estimated that approximately 29,000 future cancers would result from routine CT exposures in the United States, about 2% of all cases diagnosed annually.

Cancer risk from CT scans varies among individuals based on how many scans they undergo throughout their lifetime.

What’s more, radiation levels in CT scans vary widely from clinic to clinic. In fact, one CT scan can expose a person to 10 to 15 times as much radiation as another, according to lead author Rebecca Smith-Bindman, MD, a professor at the University of California San Francisco medical school. (For a related article about Smith-Bindman’s research, see “Some CT Scans Deliver Too Much Radiation, Researchers Say. Regulators Want to Know More.)

The largest number of cancers was projected to result from abdomen and pelvis CT scans in adults, followed by chest CT scans, according to researchers.

Overall, the most common cancers projected were lung cancer (22,400 cases), colon cancer (8,700 cases), leukemia (7,900 cases) and bladder cancer (7,100 cases). In women, breast cancer was second most common (5,700 cases).

In an accompanying editor’s note, researchers acknowledged that CT is “inextricably woven into the fabric of modern medicine.” To reduce reliance on CT scans, they suggest incorporating diagnostic algorithms at the point of care to reduce CT use among low-risk individuals, offering alternative imaging solutions like MRI and ultrasound and reducing radiation dose and more.

“Lastly, educating clinicians about avoiding low-value testing and, in circumstances where alternatives are readily available, involving patients in the decision to do a CT scan may help shift culture and practice,” authors concluded.

The ACR response to the JAMA study offers guidelines for patients considering undergoing radiation; what’s more, ACR has launched initiatives to help providers optimize radiation doses.

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