

Certain Tests in ERs Raise Cancer Risk for Some

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THURSDAY, May 29 (HealthDay News) -- Long-term buildup of radiation resulting from repeated emergency room X-rays and scans may be placing some patients at an increased risk for developing cancer, new research suggests.

At issue are routine testing procedures -- currently in widespread use in hospitals across the United States -- that emit a certain degree of ionizing radiation. Such procedures include both standard X-rays and more sophisticated CT scans, as well as nuclear medicine screenings where tiny amounts of radioactive material are swallowed and followed throughout the body.

"We're not by any means trying to say that at any given instance diagnostic testing is not appropriate," said study author Dr. Timothy Bullard, chief medical officer and a practicing emergency room physician at Florida's Orlando Regional Medical Center (ORMC). "The diagnostic testing that we're doing now is really fabulous and tremendous in terms of its capabilities. But we have to be very cognizant that it's not without potential risks. And I think that neither physicians nor patients have been focused on this concern."

Bullard presented his work Thursday at the Society for Academic Emergency Medicine annual meeting, in Washington, D.C.

Scans and X-rays rely on ionizing radiation to render diagnostic imaging on film or a computer. Magnetic resonance imaging (MRI) and ultrasound tests do not use any radiation and are not the subject of the current study.

The problem, suggested Bullard, is that while no single procedure will expose a patient to undue amounts of radiation, ER physicians have not had any way to gauge a patient's cumulative exposure.

To explore the potential dimensions of the problem, the researchers teamed up with Washington Hospital, in Washington, D.C., to conduct the first study looking into cumulative ionizing radiation exposure in an ER over a fixed period of time.

In this case, Bullard and his colleagues focused on a five-period of diagnostic testing exposure among a randomly selected group of patients attending the emergency rooms at ORMC and Washington Hospital.

The researchers found that most patient radiation exposure stemmed from CT scans and nuclear medicine testing, with patients averaging a cumulative radiation dose calculated as 40 milliseiverts (mSV) over the five-year study period.

By way of comparison, Bullard noted that 200 mSV was the average exposure level observed among Nagasaki and Hiroshima atom bomb survivors within a 2.5 kilometer-radius of each bomb epicenter. Ten percent of the study patients averaged half that amount -- or 100 mSV -- spread over the five years of the study.

The research team concluded that such figures meant that if the patient pool with whom they worked can be considered representative of the general ER population in the United States, then a significant slice of ER patients may be at an increased risk for developing cancer as a result of cumulative diagnostic radiation exposure.

Bullard pointed out that with specific respect to patient radiation exposure, in the United States there are no firm federal standards, cut-offs or recommendations.

"There are exposure safety standards for people in industries who work around radiation," he noted. "But in the past, patients per say were not typically considered to be an issue, because it was assumed they weren't exposed to radiation so much. But I think that has changed."

Backing up Bullard's perceptions and concerns is a Columbia University study published last fall in the *New England Journal of Medicine*, in which researchers noted that the number of CT scans being performed in the United States has skyrocketed over the past couple of decades.

In that publication, lead researcher David J. Brenner estimated that more than 62 million CT scans are now performed each year, up from just 3 million in 1980 -- despite the observation that upwards of one-third of all such scans are, in fact, medically unnecessary.

"Nevertheless, I would not go so far as to recommend patient standards," said Bullard. "Because how much a patient needs to undergo depends on each individual patient. Some may need a lot of diagnostic tests, and you wouldn't want to put a limit on what diagnostically could be done. But I do think that doctors and patients should be aware of exposure histories. And as a physician, before ordering a routine diagnostic test, I tend now to think: 'Do I really need this answer, and is there maybe another way to get it?' Bottom-line: Is this test absolutely necessary?"

Bullard and his colleagues suggested that the adoption of portable electronic medical records could help provide physicians with an easily accessible and clear indication of prior patient radiation exposure -- so doctors could make more judicious decisions regarding future testing.

Dr. James E. Winslow, an assistant professor at Baptist Medical Center in Winston-Salem, N.C., said the current study makes a lot of "good points."

"We've conducted our own study over the first few months of 2006 among 86 trauma patients, and we're finding average exposure levels of 41 mSV in just the first 24 hours of hospitalization," he said. "And some, certainly, had significantly more than that."

Winslow noted that over the course of an entire year, a Space Station astronaut will be exposed to 174 mSV.

"So, we're talking, potentially, about a big problem here," he said. "And I think doctors need to be aware that the screenings they are ordering do involve significant radiation output."

More information

For details on diagnostic tests and radiation exposure, visit the [Health Physics Society](#).

SOURCES: Timothy Bullard, M.D., chief medical officer, Orlando Regional Medical Center, Fla.; James E. inslow, M.D., assistant professor, Baptist Medical Center, Winston-Salem, N.C.; May 29, 2008, presentation, Society for Academic Emergency Medicine annual meeting, Washington, D.C.