RSNA®
Radiological Society of North America

820 Jorie Blvd
Oak Brook, IL 60523
TEL 1-630-571-2670
FAX 1-630-571-7837
RSNA.org

NEWS

RSNA Press Release

Unindicated CT Series Result in Unnecessary Radiation Exposure for Patients

Released: November 30, 2009

Media Contacts:	**RSNA Newsroom**	**1-312-949-3233**
Before 11/28/09 or after 12/03/09:	**RSNA Media Relations:**	**1-630- 590-7762**
	Linda Brooks 1-630-590-7738 lbrooks@rsna.org	Maureen Morley 1-630-590-7754 mmorley@rsna.org

At A Glance

- A new study found that more than half of patients undergoing abdominal CT received unnecessary additional imaging series.
- Unindicated CT series resulted in patients being exposed to unnecessary radiation.
- When appropriately utilized, CT is a valuable diagnostic tool, and patients should not be unduly concerned when they are referred for a CT exam.

CHICAGO — A large proportion of patients who undergo abdominal/pelvic computed tomography (CT) receive unindicated and unnecessary additional image acquisition resulting in excess, avoidable radiation exposure, according to a study presented today at the annual meeting of the Radiological Society of North America (RSNA).

"It is the responsibility of all physicians who work with ionizing radiation to ensure that the dosage is as low as reasonably achievable without compromising the patient's well being," said Kristie Guite, M.D., radiology resident at the University of Wisconsin (UW) in Madison. "Our study found that this principle is not being followed in many practices."

A CT examination consists of imaging the patient using a CT scanner and sometimes involves the injection of an intravenous contrast agent. Imaging can be performed at multiple time points before and/or after the injection of the contrast material. Each image acquisition is referred to as a "series." Although having multiple series can be helpful for some conditions, they are not generally necessary.

Because it provides valuable diagnostic information, CT use has risen rapidly. In recent years, a number of reports have highlighted the increasing radiation exposure to patients through the use of medical imaging, particularly CT. While these reports have often focused on general and screening uses, little attention has been paid to radiation from additional series, including routine non-contrast or delayed-phase CT, which may or may not be indicated by the patient's condition but are sometimes performed so that nothing is overlooked.

To determine the frequency of unindicated additional scanning and the resultant excess radiation exposure to patients, the researchers reviewed the appropriateness and radiation dose of abdomen and pelvis CT exams for 500 patients performed at outside institutions and submitted to UW — Madison for interpretation. The patients ranged in age from nine months to 91 years, with most between 30 and 50 years old.

There were a total of 978 series for the 500 patients. Using the American College of Radiology (ACR) Appropriateness Criteria®, 35.3 percent (345/978) of the CT series in 52.2 percent (261/500) of the patients were determined to be unindicated. The most common unnecessary exam was delayed-phase imaging, accounting for 268 (77.7 percent) of the 345 unnecessary series. In delayed-phase imaging, several images of the same region are obtained a short period of time after contrast injection to detect changes. Among the 500 patients, the mean excess radiation dose per patient from unnecessary scans was 11.3 millisieverts (mSv), equivalent to the dose received from 113 chest x-rays or three years of naturally occurring background radiation.

"We suspect that at many institutions there is a lack of focus on selecting CT protocols tailored specifically to answer the clinical question," said coauthor J. Louis Hinshaw, M.D., assistant professor of radiology at UW — Madison. "It is certainly easier to select an 'every size fits all' approach."

The researchers also noted a possible connection in some cases between additional scanning and increased payment, such as performing both non-contrast and contrast-enhanced scans when only one series was indicated.

Efforts are ongoing to protect patients from unnecessary radiation exposure from medical imaging procedures, including the Image Gently initiative for safety in pediatric radiology and an ACR-RSNA task force for adult radiation protection. In addition to following strict appropriate imaging utilization standards, radiologists and medical physicists stress the importance of minimizing dose without sacrificing diagnostic ability. Advances in CT technology over recent years have markedly decreased dose while maintaining optimal image quality.

Dr. Guite advises patients not to be unduly alarmed when their physician orders a CT exam.

"The use of CT has been a huge benefit to human health," she said. "When used appropriately, the benefits of the diagnostic information obtained with CT far outweigh the potential risks."

Dr. Hinshaw suggests that patients ask their physicians about the risks and benefits of the proposed exam and inquire at the CT facility as to the number of series that will be performed, and if a smaller number of series would be sufficient.

Coauthors are Frank N. Ranallo, Ph.D., and Fred T. Lee, M.D.

# # #

Note: Copies of RSNA 2009 news releases and electronic images will be available online at *RSNA.org/press09* beginning Monday, Nov. 30.

RSNA is an association of more than 44,000 radiologists, radiation oncologists, medical physicists and related scientists committed to excellence in patient care through education and research. The Society is based in Oak Brook, Ill. (*RSNA.org*)

Editor's note: The data in these releases may differ from those in the printed abstract and those actually presented at the meeting, as researchers continue to update their data right up until the meeting. To ensure you are using the most up-to-date information, please call the RSNA Newsroom at 1-312-949-3233.

For patient-friendly information on CT and radiation safety, visit *RadiologyInfo.org*.