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NEWS

RSNA Press Release

Emergency Room CT Exams Have Increased in Children with Abdominal Pain

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At A Glance

- Between 1999 and 2007, CT utilization in children increased each year in U.S. emergency departments.
- Children evaluated in pediatric emergency departments were more than 25 percent less likely than those seen at general emergency departments to undergo CT imaging for abdominal pain.
- While CT scans provide rapid, accurate diagnosis, they expose patients to ionizing radiation—an important consideration for pediatric patients.

OAK BROOK, Ill. — Computed tomography (CT) utilization in pediatric patients with non-traumatic abdominal pain increased in emergency departments each year between 1999 and 2007, according to a new study published online in the journal *Radiology*. The study authors found no corresponding increase in ultrasound use during the same period, despite research supporting it as an important diagnostic tool for assessing pediatric abdominal pain.

Non-traumatic abdominal pain is a common source of pediatric visits to the emergency department. Physicians often order CT exams when abdominal pain suggests appendicitis. While CT scans provide rapid, accurate diagnosis, they expose patients to ionizing radiation—an important consideration for children due to their longer life expectancy and increased susceptibility to radiation effects.

"Our findings help give us an overall understanding of places where we can tackle disparities of use and disparities in care," said Anastasia L. Hryhorczuk, M.D., clinical fellow at Children's Hospital Boston. "Ideally, we'd like to see the same standard of care being applied across the country to protect children from unnecessary radiation exposure."

Anastasia L. Hryhorczuk, M.D.

Research has shown that step-by-step evaluations of pediatric patients, beginning with ultrasound and proceeding to CT if ultrasound is negative or uncertain, is the most accurate path for diagnosing appendicitis. Dr. Hryhorczuk and colleagues sought to determine if this strategy had been incorporated into general emergency department practices.

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For the study, researchers looked at data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) to evaluate imaging utilization among children with acute abdominal pain in U.S. emergency departments.

From 1999 to 2007, there were 16,900,000 pediatric emergency department visits for acute abdominal pain. The odds of a child receiving a CT scan increased during each year of the study period, despite the fact that there were no statistically significant changes in ultrasound usage, numbers of patients admitted to the hospital, or numbers of patients with acute appendicitis. Only three percent of patients ultimately diagnosed with appendicitis were imaged with both ultrasound and CT.

Children evaluated in pediatric emergency departments were more than 25 percent less likely than those seen at general emergency departments to undergo CT imaging for abdominal pain.

"In a pediatric setting, clinicians may have skills for evaluating patients that favor management without imaging, lowering CT usage," Dr. Hryhorczuk said.

Statistical analysis demonstrated increased odds of CT use in teens, white patients, the Midwest region, urban settings, patients with private insurance, and patients who were admitted or transferred.

Although the study did not investigate reasons for these variations, Dr. Hryhorczuk pointed out that CT scanners are readily available in hospitals, whereas access to ultrasound may be limited based on operator availability in some areas. The local legal climate also may play a factor in obtaining imaging exams, according to the study, as appendicitis diagnoses are a source of lawsuits in the pediatric emergency setting.

The time period of the study predates "Image Gently," a 2008 initiative of the Alliance for Radiation Safety in Pediatric Imaging that promotes radiation safety in the imaging of children. The researchers hope that further investigation of NHAMCS data will provide more information on the success of this and other programs aimed at lowering medical radiation exposure in children.

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"Pediatric Abdominal Pain: Use of Imaging in the Emergency Department in the United States from 1999 to 2007." Collaborating with Dr. Hryhorczuk were Rebekah C. Mannix, M.D., M.P.H., and George A. Taylor, M.D.

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