
Study: CT Can Change ER Physicians' Diagnoses



In emergency department settings, CT scan results can substantially change physicians' diagnoses, diagnostic confidence, and admission decisions, according to a new study from the Massachusetts General Hospital (MGH) Institute for Technology Assessment. The finding, reported in the journal *Radiology*, adds important information to health policy debates regarding the appropriate use of CT scanning.

"Emergency department physicians who face increasing pressure to make clinical decisions quickly are sometimes criticised for ordering too many CT scans that may not be clinically justified," says lead author Pari Pandharipande, MD, MPH, director of the MGH Institute of Technology Assessment. Although the use of CT scanning in emergency departments (EDs) has more than tripled in the past 20 years, the researchers note that the benefits of increasing those procedures have not been clear.

The study was conducted at four major academic medical centres in the U.S. between July 2012 and January 2014. Participating ED physicians evaluating patients with abdominal pain, chest pain/shortness of breath, or headache were asked to complete brief surveys after their initial evaluation of the patients and again after receiving CT scan results. Pre-CT surveys asked for their initial diagnosis, their confidence in that diagnosis, any alternative diagnoses that should be ruled out and their current management decisions. Post-CT surveys asked whether the initial diagnosis had changed, whether the CT scan had helped to confirm or rule out alternative diagnoses, and whether management decisions had changed.

Overall, 245 physicians completed both pre- and post-CT surveys for 1,280 patients who comprised the study group. In more than 80 percent of instances, the post-CT survey was completed the same day as the pre-CT survey. Key findings of the study include:

- After CT, physicians' leading diagnoses changed for 51 percent of patients with abdominal pain, 42 percent of patients with chest pain/shortness of breath, and 24 percent of patients with headache.
- The CT scan helped to confirm or rule out alternative diagnoses 95 to 97 percent of the time, across all symptom groups.
- After CT, decisions about admitting patients to the hospital were changed 19 to 25 percent of the time.

"While there was a wide spectrum of diagnostic confidence before CT, the greater a physician's initial confidence in a diagnosis, the less likely that diagnosis was to change after CT, indicating that physicians were sound judges of their own diagnostic certainty," explains Dr. Pandharipande, who is an assistant professor of Radiology at Harvard Medical School. "But even in instances where physicians' pre-CT confidence in their initial diagnosis was greater than 90 percent, there were still changes in from 4 to 21 percent of cases."

The study focused on the benefits of emergency department CT scanning and did not address the costs and risks, such as radiation exposures, factors that must be included in a full risk/benefit evaluation, the researchers point out. Still, the size and consistency of the benefits observed in this study indicate that policies solely designed to reduce the use of ED CT scans could compromise patient care.

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