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NEWS

RSNA Press Release

Obesity an Increasing Obstacle to Medical Diagnosis

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At A Glance

- The number of diagnostic exams rendered inconclusive due to obesity has doubled over a 15-year span.
- Abdominal ultrasound yielded the most inconclusive exams in obese patients, followed by chest x-rays.
- Approximately 66 percent of U.S. adults are currently overweight, obese or morbidly obese.

OAK BROOK, Ill.—The increase of obesity in the United States doubled the number of inconclusive diagnostic imaging exams over a 15-year period, according to a study featured in the August issue of *Radiology*. Researchers assessed all radiology exams performed at Massachusetts General Hospital (MGH) between 1989 and 2003 to determine the effects of obesity on imaging quality and diagnosis.

In an effort to quantify how obesity affects diagnostic imaging quality, Dr. Uppot and colleagues analyzed radiology records from a 15-year span at MGH. They searched for incomplete exams that carried the label "limited by body habitus," meaning limited in quality due to patient size.

"While 0.10 percent of inconclusive exams were due to patient size in 1989, by 2003 the number had jumped to 0.19 percent, despite advances in imaging technology," said Raul N. Uppot, M.D., lead author and staff radiologist at MGH. "Americans need to know that obesity can hinder their medical care when they enter a hospital."

An estimated 66 percent of adults in the United States are overweight, obese or morbidly obese, according to the Department of Health and Human Services. Additionally, more than 12.5 million American children and adolescents are overweight. Hospitals are feeling the strain-they now require larger wheelchairs and beds. Additionally, standard operating tables and imaging equipment are not suited for obese patients.

By 2003, the modality that yielded the most difficulties in rendering a diagnosis was abdominal ultrasound (1.90 percent), followed by chest x-rays (0.18 percent), abdominal computed tomography (CT), abdominal x-rays, chest CT and magnetic resonance imaging (MRI) (all anatomic regions included).

CT and MRI can be problematic because of weight limitations of the imaging table and the size of the opening on the imager (patients are inserted through a small "hole in the doughnut"). Standard CT tables can accommodate patients weighing up to 450 pounds, and

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MRI machines can typically obtain diagnostic-quality images in patients weighing up to 350 pounds.

For exams that require radiation exposure, such as x-rays and CT, the power can be increased on standard machines in an attempt to acquire a higher-quality image. However, this leads to an undesirable increase in radiation dose.

Incomplete examinations related to obesity can lead to serious consequences for the patient, as in the case of misdiagnosis or failure to be able to assign a diagnosis at all. There can also be economic ramifications. Further testing might be required in the event of an inconclusive exam, as well as increased hospitalization time.

Obesity also increases stress on the imaging systems, due to increased power output and more rapid burnout (as in the case of x-ray tubes).

Dr. Uppot believes that the prevailing lifestyle in the United States and other industrialized nations that facilitates a poor diet and lack of exercise has led to our current obesity crisis.

"In the short term, the medical community must accommodate these patients by investing in technology to help them," Dr. Uppot explained. "In the long term, this country must make cultural shifts that promote more exercise and a healthier diet."

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Journal attribution required.

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"Effect of Obesity on Image Quality: Fifteen-year Longitudinal Study for Evaluation of Dictated Radiology Reports." Collaborating with Dr. Uppot on this paper were Dushyant V. Sahani, M.D., Peter F. Hahn, M.D., Ph.D., Mannudeep K. Kalra, M.D., Sanjay S. Saini, M.D., M.B.A., and Peter R. Mueller, M.D.

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