

Radiation dose can be reduced for 'triple rule-out' coronary CT angiography

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Physicians can dramatically reduce the radiation dose delivered to patients undergoing coronary CT angiography in a "triple rule-out" protocol by simply using tube current modulation, according to a study performed at Thomas Jefferson University Hospital in Philadelphia, PA.

The study included 172 patients who were evaluated using coronary CT angiography without tube current modulation and 95 patients who were evaluated with tube current modulation. The effective [radiation dose](#) ranged between 9.9 and 31.3 mSv in patients without modulation; the dose ranged between 5.4 and 16.6 mSv in patients with modulation. "Image quality was comparable to when we didn't use tube current modulation," said Kevin M. Takakuwa, MD, lead author of the study.

"One of the major criticisms of the triple rule out coronary CT angiography study is the concern about the high amount of radiation given, which has been estimated by some to be as high as 30-40 mSv. Our study demonstrates that the radiation is a lot less, averaging less than 9 mSv when using tube current modulation. In addition, it uses less radiation than a nuclear stress test, a common alternative study to the triple rule-out cardiac CT," he said.

"Cardiac CT in a "triple rule-out" protocol allows us to look for [coronary artery disease](#), aortic dissections and pulmonary emboli. These are three potentially life-threatening causes of chest pain that we cannot afford to miss in the emergency room. When we perform this test on

undifferentiated chest pain patients we are able to identify disease entities that cannot be made with nuclear stress testing. For example, we have diagnosed metastatic cancers, pulmonary embolism and pneumonia that would have been missed by stress testing alone. Cardiac CT is also much quicker than a stress test and can save people from getting an invasive cardiac catheterization," said Dr. Takakuwa.

"Our goal is to be able to perform cardiac CT using tube current modulation 24/7 and as a means to be able to admit or discharge patients more rapidly," he said.

This study appears in the April issue of the *American Journal of Roentgenology*.

Source: American Roentgen Ray Society

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