

# Multidetector computed tomography in early diagnosis of patients with acute chest pain

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Acute nontraumatic chest pain is a common presenting symptom to the emergency department. The examination must be able to exclude life-threatening conditions, including pulmonary embolism, aortic dissection, and acute coronary syndrome.

Several “triple rule-out” protocols have been proposed to provide high-quality images covering the thoracic aorta, coronary, and pulmonary arterial trees. Studies have shown that coronary computed tomography (CT) using a 256-detector row dual-source is a safe and efficient method for triage patients with acute chest pain who have a low to intermediate likelihood of coronary artery disease (CAD), with a high diagnostic efficacy, time efficiency and cost-effectiveness.

The protocol included three axial nongated volume acquisitions to cover the chest with triggering at the pulmonary arteries followed by a prospectively ECG-gated cardiac scan for the coronary arteries. Multidetector computed tomogra-

phy (MDCT) has rapidly evolved from the 4-detector row systems in 1998 to the 256-slice and 320-detector row CT systems. With a smaller detector element size and higher gantry rotation speed, spatial and temporal resolution of the 256-slice MDCT scanners, has enabled volumetric imaging of the entire heart free of stair-step artifacts at a single time point within one cardiac cycle. Such scanners hold promise in performing a rapid high quality “triple rule-out” test without a high contrast load and with a small radiation dose. These emerging technical advances and novel applications will continue to change the way we study CAD beyond detecting luminal stenosis.

We shall focus on three aspects of managing the patients with acute chest pain:

1. Imaging to increase the number of correct diagnoses in the acute situation;
2. Imaging to rule out other coronary causes of chest pain;
3. Use of imaging for risk stratification, once myocardial infarction has been ruled out in the chest pain unit.

**KEYWORDS:** computed tomography, acute chest pain, aortic dissection, pulmonary embolism, wide area detector, triple rule-out protocol.

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