Atherosclerotic heart disease is one of the most common causes of morbidity and mortality, but there is a large subset of the 6 million patients per year who come to the Emergency Department with acute chest pain who are at low risk for acute coronary syndrome (ACS). Because of the medical-legal climate in the United States, these patients undergo a plethora of diagnostic testing and even admission to the hospital to rule out ACS.

Coronary Computed Tomography Angiography (CCTA), a noninvasive method to image the coronary arteries, is starting to be used in EDs for suspected ACS. Two papers (Litt et al., and Hoffman et al.; both NEJM 2012) evaluated the safety, time and cost savings of CCTA. Both studies were multicenter, randomized, controlled trials of low-to-intermediate risk patients, each with approximately 1000 patients. Both studies found CCTA to be a safe modality with which to risk stratify patients; those with less than 50% stenosis of major coronary arteries who were sent home from the ED without further testing (after two sets of negative cardiac biomarkers) had a less than a 1% rate of adverse outcomes at one month. Both studies found that CCTA provides faster diagnostic results and thus shorter lengths of stay than standard evaluation, although no cost savings were found. It is too early to calculate long-term cost savings, safety, and the duration of time for which a “negative CCTA” for significant stenosis can be relied upon to make the possibility of ACS during future acute chest pain crises unlikely.

**Bottom line:** Sending low-to-intermediate risk patients home who have a CCTA showing <50% stenosis of coronary arteries is safe. However, the “expiration date” of a negative CCTA is still unknown.

Critics of CCTA argue that low-to-intermediate-risk patients should not have diagnostic testing at all. CCTAs are technically challenging studies to obtain, have a long acquisition time, and require a specially-trained radiologist. Risks of CCTAs include contrast nephropathy, radiation, side-effects from the medications (e.g. bradyarrhythmias) using during acquisition, and adverse events resulting from interventions made on incidental findings. Hoffman et al. found that the group who received CCTA had an increase in downstream testing and radiation exposure. However, lacking a divining rod and a cultural shift in the acceptable miss rate, it is likely that these testing trends will continue.

**Bottom line:** CCTAs are not without risk during and after acquisition.

A third studied reviewed at this journal club (Blankenstein et al. 2012) attempts to correlate CCTA findings with those of exercise treadmill testing (ETT). This was a subset of patients from an observational cohort study (ROMICAT). The conclusions are completely unremarkable: patients with a high number of risk factors are more likely to have obstructive coronary artery disease and those who are young or who would be expected to have a high exercise capacity are unlikely to have coronary stenosis.

**Bottom line:** We do not yet know how to integrate CCTA into diagnostic schemas. ETT is insensitive, but may still be an appropriate first line test for low-to-intermediate-risk patients.