



<b>Title</b>	<b>Systematic Review of the Clinical Effectiveness and Cost Effectiveness of 64-Slice or Higher Computed Tomography Angiography as an Alternative to Invasive Coronary Angiography in the Investigation of Coronary Artery Disease</b>
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<b>Reference</b>	Volume 12.17. ISSN 1366-5278. <a href="http://www.hta.ac.uk/project/1545.asp">www.hta.ac.uk/project/1545.asp</a>

## Aim

To assess the clinical and cost effectiveness, in different patient groups, of using 64-slice or higher computed tomography (CT) angiography instead of invasive coronary angiography (CA) in diagnosing suspected coronary artery disease (CAD) and assessing people with known CAD.

## Conclusions and results

The main value of 64-slice CT may be to rule out significant CAD. Avoiding unnecessary CA through the use of 64-slice CT appears likely to save costs in the diagnostic pathway. However, 64-slice CT is unlikely to replace CA in assessing revascularization of patients, particularly as angiography and angioplasty are often done on the same occasion. The diagnostic accuracy and prognostic studies enrolled over 2500 and 1700 people, respectively. Overall quality of the studies was reasonably good. In the pooled estimates, 64-slice CT angiography was highly sensitive for patient-based detection of significant CAD (defined as 50% or more stenosis), while across studies the negative predictive value (NPV) was very high (median 100%, range 86% to 100%). In segment-level analysis compared with patient-based detection, sensitivity was lower and specificity higher, while across studies the median NPV was similar (99%, range 95% to 100%, versus 100%, range 86% to 100%). See Executive Summary link at [www.hta.ac.uk/project/1545.asp](http://www.hta.ac.uk/project/1545.asp).

## Recommendations

The proportion of CA that could be replaced by 64-slice CT is uncertain. Reduction in CA would occur mainly at the diagnostic end of the pathway, in both elective assessment of chest pain of possibly anginal origin, and assessment of suspected acute coronary syndromes in some patients with normal or equivocal ECGs and negative troponin tests. In emergency situations, some hospital admissions might be avoided. However, to do so, 64-slice CT would need to be readily available, ideally on a 24-hour basis, which is unlikely to be the case in most hospitals. Some perfusion studies could also

be replaced by 64-slice CT angiography. One issue is whether to acquire 64-slice CT systems, or wait until 256-slice systems become available. Evidence on 256-slice CT is sparse. However, it is unlikely that performance would be inferior, and if cost differences between 64- and 256-slice machines were small, it could be argued that the NHS should bypass 64-slice machines in favor of 256-slice ones. At some point the extra data might not provide additional clinical benefit, but it is not yet clear when that point will be reached.

## Methods

See Executive Summary link at [www.hta.ac.uk/project/1545.asp](http://www.hta.ac.uk/project/1545.asp).

## Further research/reviews required

Further research is required on the marginal advantages and costs of 256-slice CT versus 64-slice CT, the usefulness of 64-slice CT in people with suspected acute coronary syndrome, the potential of multislice CT to examine plaque morphology, the role of CT in identifying patients suitable for coronary artery bypass grafting, and the concerns raised about the use and repetitive use of 64-slice or higher CT angiography in younger individuals or women of childbearing age. See Executive Summary link at [www.hta.ac.uk/project/1545.asp](http://www.hta.ac.uk/project/1545.asp).