

# Application of SPECT/CT in coronary artery disease

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It is the aim of this presentation to enable its attendees to:

Understand the principles of myocardial perfusion and blood flow, factors determining flow, coronary flow regulation, vasoreactivity, coronary flow reserve, regional flow differences, and flow variability.

Know the value of perfusion imaging in the diagnosis, prognosis, and management of patients with coronary artery disease.

Know the advantages of combined SPECT/CT in the diagnostic management of coronary artery disease.

A most common cause of heart failure is coronary artery disease (CAD), caused by a narrowing of the blood vessels that supply nutrients and oxygen to the heart. Whereas coronary CT angiography (CCTA) can detect coronary atherosclerosis in early stages by measuring morphology in terms of the dimensions of the coronary arteries and the presence of calcification, myocardial perfusion imaging (MPI) can estimate the hemodynamic consequences of coronary artery stenosis by assessing myocardial blood flow using gamma camera SPECT. The use of hybrid systems as SPECT/CT makes it possible to get both anatomical and physiological information in one study. It is important to bear in mind that CCTA and MPI give complementary information on the risk of future coronary events, providing additional and more accurate information to the clinician. The integration of SPECT and CT can improve the quality of MPI by enabling attenuation correction from CT-mapping of the thorax as well as add further risk stratification by coronary artery calcium (CAC) scoring. Subsequently SPECT and CT will enable new and perhaps also individually tailored diagnostic strategies and therapeutic approaches for patients with suspected or known CAD.

## References

Slart R, Tio R, Zijlstra F, et al. Diagnostic pathway of integrated SPECT/CT for coronary artery disease. *Eur J Nucl Med Mol Imaging* 2009; 36: 1829-1834.

Mahmarián J. Combining myocardial perfusion imaging with computed tomography for diagnosis of coronary artery disease. *Curr Opin Cardiol* 2007; 22: 413-421.

Kaufmann P, Carli M. Hybrid SPECT/CT and PET/CT Imaging: The Next Step in Noninvasive Cardiac Imaging. *Semin Nucl Med* 2009; 39: 341-347.