



► **State of the Art in Myocardial Imaging**

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The rapid technological evolution accomplished in noninvasive cardiac imaging techniques over the last decades has provided physicians with a large armamentarium for the evaluation of patients with known or suspected coronary heart disease. Noninvasive assessment of coronary artery calcium or noninvasive coronary angiography may be performed using computed tomography or magnetic resonance imaging. These techniques evaluate the presence of atherosclerosis rather than ischemia. Conversely, nuclear cardiology is the most widely used noninvasive approach for the assessment of myocardial perfusion and function. Gated myocardial perfusion single-photon emission computed tomography (MPS) provides important information on the extent and severity of myocardial perfusion abnormalities, including stress-induced ischemia, left ventricular cavity size, left ventricular function, and mechanical dyssynchrony. Moreover, other prognostic imaging data can be provided, such as transient ischemic dilation, lung uptake, right ventricular uptake, post-stress left ventricular ejection fraction and sphericity index. The available single-photon emission computed tomography flow agents are characterized by a cardiac uptake proportional to myocardial blood flow. In addition, different positron emission tomography tracers may be used for the quantitative measurement of myocardial blood flow and coronary flow reserve, thanks to the higher spatial resolution, the higher sensitivity in the identification of small concentrations of radiotracers, and the higher temporal resolution of positron emission tomography imaging compared to MPS. These techniques coupled with the development of dedicated image fusion software packages to merge data sets from different modalities have paved the way for hybrid imaging. This presentation provides a description of the available noninvasive imaging techniques in the assessment of coronary anatomy, myocardial perfusion, and cardiac function in patients with known or suspected coronary heart disease.

**References:**

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