

## Myocardial SPECT

Young-Hak Kim, MD, PhD

Department of Internal Medicine

Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Single-photon emission computed tomography (SPECT) is a nuclear medicine topographic imaging technique that uses gamma rays. SPECT is based upon the flow-dependent and/or metabolism-dependent selective uptake of a radioactive tracer by functional myocardial tissue. This method was developed to evaluate myocardial perfusion and viability and is applied both at rest and after exercise or pharmacologic stress to assess inducible ischemia due to flow limiting coronary stenoses. Diagnosis of coronary artery disease (CAD) and various cardiac abnormalities: In patients who present with acute, stable chest pain, SPECT has been shown to be more cost-effective than any other diagnostic modality to date and more accurate than exercise ECG in detecting myocardial ischemia. Identifying the location and degree of CAD in patients with history of CAD: Inferior and posterior abnormalities and small areas of infarction can be identified, as well as the occluded blood vessels and the mass of infarcted and viable myocardium. Prognostication (risk stratification): In patients with known CAD, SPECT has been proven the single more powerful technique in predicting the likelihood of future cardiac events. Post intervention revascularization (coronary artery bypass graft or angioplasty) evaluation is also performed. However, due to the balanced ischemia, false negative result in patients with multivessel or left main disease is a limitation of SPECT. Recently, there is technical advancement in myocardial perfusion SPECT. Integration of SPECT and computed tomography provides anatomical and function information of coronary artery and myocardium. In addition, new technology of myocardial SPECT allows evaluation of absolute myocardial flow of coronary artery. In this lecture, clinical application of myocardial SPECT will be presented.