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Diagnostic accuracy of rest/stress ECG-gated Rb-82 myocardial perfusion PET: comparison with ECG-gated Tc-99m sestamibi SPECT.

[Bateman TM](#), [Heller GV](#), [McGhie AI](#), [Friedman JD](#), [Case JA](#), [Bryngelson JR](#), [Hertenstein GK](#), [Moutray KL](#), [Reid K](#), [Cullom SJ](#).

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Abstract

BACKGROUND: Although single photon emission computed tomography (**SPECT**) and positron emission tomography (**PET**) **myocardial perfusion** imaging (MPI) have evolved considerably over the last decade, there is no recent **comparison** of **diagnostic** performance. This study was designed to assess relative image quality, interpretive confidence, and **diagnostic accuracy** by use of contemporary technology and protocols.

METHODS AND RESULTS: By consensus and without clinical information, 4 experienced nuclear cardiologists interpreted 112 **SPECT** technetium-99m **sestamibi** and 112 **PET** rubidium-82 MPI electrocardiography (ECG)-gated **rest**/pharmacologic **stress** studies in patient populations matched by gender, body mass index, and presence and extent of coronary disease. The patients were categorized as having a low likelihood for coronary artery disease (27 in each group) or had coronary angiography within 60 days. **SPECT** scans were acquired on a Cardio-60 system and **PET** scans on an ECAT ACCEL scanner. Image quality was excellent for 78% and 79% of **rest** and **stress PET** scans, respectively, versus 62% and 62% of respective **SPECT** scans (both $p < .05$). An equal percent of **PET** and **SPECT** gated images were rated excellent in quality. Interpretations were definitely normal or abnormal for 96% of **PET** scans versus 81% of **SPECT** scans ($p = .001$). **Diagnostic accuracy** was higher for **PET** for both stenosis severity thresholds of 70% (89% vs 79%, $p = .03$) and 50% (87% vs 71%, $p = .003$) and was higher in men and women, in obese and nonobese patients, and for correct identification of multivessel coronary artery disease.

CONCLUSION: In a large population of matched pharmacologic **stress** patients, **myocardial perfusion PET** was superior to **SPECT** in image quality, interpretive certainty, and **diagnostic accuracy**.

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