Automatic Segmental Scoring of Myocardial Wall Thickening and Motion: Validation of a New Semi-Quantitative Algorithm.
EP Ficaro, JN Kritzman, JR Corbett.
University of Michigan Health System, Ann Arbor, MI.

Objectives: Segmental wall thickening and motion scores are useful measures of regional ventricular function and myocardial viability. The purpose of this study was to validate a new algorithm for automatic semi-quantitative scoring of myocardial thickening and motion.

Methods: Automatic segmental scoring of myocardial wall thickening and motion was performed using 4D-MSPECT. The LV was segmented using a standard 17 segment model and each segment was scored from 0 (normal) to 3 (no thickening) and from 0 (normal) to 4 (dyskinetic motion). A population of 109 pts (age 56.7 ± 13.1yrs; 72 male) with known or suspected CHD or age matched low likelihood normals was studied. Each patient underwent stress perfusion imaging using a same day or two day $^{99m}$Tc Sestamibi protocol. Automatic segmental and summed computer scores were compared with the consensus scores from two experts. A total of 1853 segments were scored by each observer for both thickening and motion.

Results: The study population of 109 pts included 86 with angiographic coronary disease; most with moderate to severe defects. There was perfect agreement between automatic segmental thickening scores and expert scores in 1120 segments (60.4%) and agreement within ±1 grade in 1683 segments (90.8%). There was perfect agreement between automatic segmental motion scores and expert scores in 1264 segments (68.2%) and agreement within ±1 grade in 1702 segments (91.9%).

Conclusion: Automatic computer generated semi-quantitative segmental LV myocardial wall thickening and wall motion scores may be determined with a high degree of agreement with expert determined interpretations.