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How to improve diagnostic accuracy

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Stress myocardial perfusion imaging has been shown by numerous authors to have an outstanding accuracy for the detection of coronary artery disease (CAD) (1). Despite the given relatively high accuracy rates associated with SPECT imaging, there is further information that can be gained by the use of gating as an adjunct. The use of gating may result in an improvement in reader confidence in the interpretation rendered (2). Although this phenomenon is difficult to verify and quantitative it is reasonable to expect that it would result in a reduction in number of "equivocal" scans reported. Operator independent quantitative assessment of regional myocardial perfusion is a principal competitive advantage of nuclear cardiology over other modalities. In different subsets of patients, quantitative assessment of myocardial perfusion and function relies to a significant improvement in diagnostic accuracy. This assessment is now nearly fully automated using a variety of approaches (3). The potential of such automated processing is reliable reader-independent and laboratory independent, which would improve accuracy of a single assessment and facilitate assessment of the interval change (4). Sensitive methods for detection and estimation of changes in myocardial perfusion over time could improve confidence in using myocardial perfusion SPECT for these applications (4). Published data suggest that the measurements of serial perfusion changes in SPECT using direct comparisons may be more sensitive than standard quantitative or visual approaches.

Validation of quantitative myocardial perfusion is challenging since there is no widely available equivalent "gold standard" to which the results can be compared. Furthermore, while angiography can be used as a "gold standard" only for the task of detection of coronary disease, it is generally not considered an accurate standard for perfusion defect sizing.

References

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