

Myocardial Viability

Tests of myocardial viability attempt to predict which patients will benefit from revascularization. These tests have become standard clinical practice. However, many patients with myocardial viability tests indicating no viability do in fact benefit from revascularization, and many physicians perform revascularization on patients with these results. In addition some patients who had tests which indicate viable myocardium have not benefited from revascularization. There is little evidence of the impact of these tests in clinical decisionmaking and overall patient outcomes.

SPECT is one widely used test to measure myocardial viability, however, it is not clear whether this technology is universally available or considered the current standard of care for this test. Since CMS currently covers SPECT, and only covers PET when SPECT results are uncertain, we reviewed information from three recent well-done TA's to determine the sensitivity and specificity of PET compared to SPECT and other available tests. These TA's found the following:

- **Positron Emission Tomography (Australia, 2000):** This review of PET literature focused on the added value of PET in patients who have already had SPECT. The review found that PET seems more sensitive and specific than SPECT but that the two tests disagree on a relatively small number of patients. Only one study was correctly designed to determine the incremental value of PET over SPECT. Of the patients with discordant results, PET was overall the better predictor of myocardial recovery, with almost all PET results correct and SPECT results incorrect predictors.
- **Functional Diagnostic Imaging in the Assessment of Myocardial Viability (Alberta, Canada, 1999):** This is a comprehensive review of many different functional diagnostic imaging tests including PET, SPECT and dobutamine echo. This report found that there are few good data on the influence of any of the tests on patient management. Overall, the sensitivity of PET, SPECT and dobutamine echo was similar. The specificity of PET and dobutamine echo was similar, and both were better than SPECT.

- **INAHTA summary (1999):** This summary of 11 different technology assessments found a general agreement on the “comparable or superior performance of PET to other myocardial perfusion imaging alternatives, particularly thallium-201 SPECT” but with no clear conclusions about the extent of the improvement due to PET. The summary notes that PET is more costly than other alternatives and that consideration should be given to the most overall cost effective approach.

Overall, these reviews suggest that there is consensus that the specificity of PET is better than SPECT, with similar or slightly better sensitivity for PET. If the assumption is made that myocardial viability is a valuable concept, and SPECT is a valid way to measure myocardial viability, these reviews find that PET is a better test than SPECT. The only reasons to prefer SPECT would be based on availability of PET scanners or the relatively higher cost of PET.

It may be possible to use the information in the existing reports for your coverage decision. The information in the reports is accurate as of one year ago.

Options to expand the analysis include:

- Assume that the measurement of myocardial viability is useful and update the data on relative sensitivity and specificity of PET compared to SPECT. Note that we do not anticipate any significant changes to the estimated relative sensitivity and specificity based on such a review. We estimate that this review would take 4-6 weeks.
- Assume the measurement of myocardial viability is useful, and update the data on relative sensitivity and specificity of SPECT, PET, dobutamine echo (and other emerging technologies such as MRI?) in an attempt to identify the best overall test. We estimate that this review would take 10-12 weeks.
- Reevaluate the role of the measurement of myocardial viability by any method, and update the data on effect of SPECT, PET, dobutamine echo (and other emerging technologies such as MRI?) on patient management and overall health outcomes in an attempt to identify the best overall patient management strategy. We estimate that this review would take 6 months.