First and Second versus Second and Third Exercise Tests

To the Editor:

"An appraisal of coronary bypass grafting" by Kouchoukos, Kirklin and Oberman (Circulation 50: 11, 1974) is a welcome addition to the reasoned evaluation of this potentially valuable operation. While the authors necessarily present the results of a large uncontrolled experience, they do so with the great care and appropriate caveats which should have accompanied the voluminous literature on the subject.

If there is a significant weakness in this excellent paper, it may be that of falling into a common trap — the uncritical acceptance of exercise results. Investigators of physiologic and pathologic exercise responses have repeatedly demonstrated that the first exercise challenge usually is a learning experience (the precise nature of which is incompletely understood) so that virtually every subject or patient performs significantly better the second time — even a year later. Thus, to be meaningful, an exercise study after any therapeutic intervention (medical or surgical) should be at least the third rather than the second challenge.

Despite this criticism, the presentation of data, their analysis and the statements of conclusions by Dr. Kirklin and colleagues represent a signal advance in the effort to protect our coronary patients by determining who should and who should not be denied coronary bypass surgery.

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The author replies:

As is his usual practice, Dr. Spodick has identified a possible flaw in logic, in this case that used in interpreting the results of exercise testing following coronary artery bypass grafting. Under the original impetus of Dr. Joseph T. Reeves and with the continuing leadership of Dr. Lowell T. Sheffield, the laboratories of the Division of Cardiology at the University of Alabama Medical Center, have had a long interest in the response of man to exercise and in exercise testing. On the basis of this, Dr. Sheffield agrees completely with Dr. Spodick's comment that the first exercise challenge is usually a learning experience and that most patients perform significantly better the second time. Dr. Kouchoukos, Dr. Oberman, and I accept his criticism as a constructive one.

In spite of these considerations, we believe that some information is available in studies in which the response of two different groups of patients to a second exercise test is compared. Thus in the study by Lapin et al. (Circulation 47:1164, 1973) there was a statistically highly significant difference in the response to exercise of patients, all of whom have patent grafts, compared to patients with no patent grafts, in favor of the former group. Likewise, in the 53 patients referred to in our paper as having high grade stenoses or total occlusion of only the left anterior descending coronary artery, there was a statistically highly significant difference between those patients whose graft was patent compared to those whose graft was occluded, in favor of the former. Thus while accepting Dr. Spodick's criticism as valid and while planning to incorporate it in future studies, we believe the present evidence strongly suggest that patent saphenous vein bypass grafts in patients with significant coronary artery disease do usually result in a true improvement in the response to exercise testing compared to those with nonpatent grafts.

In reviewing this paper, written a year ago, we believe that there are good data to support one additional indication for operation, and that is the presence of a significantly stenotic lesion in the left main coronary artery. Our own data and those of others indicate that the survival over a period of about two and a half years of patients in this category who have had saphenous vein bypass grafting is significantly better than that of similar patients treated medically. We believe this is a category in which the data indicate that the operation prolongs life as well as usually relieves symptoms.

We are indebted to Dr. Spodick for his interest and comments, for surely it is through the accumulation of appropriate data and debate concerning their interpretation, that knowledge in this and other fields progresses.

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Circulation, Volume 51, February 1975
Letter: First and second versus second and third exercise tests.
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Circulation. 1975;51:394
doi: 10.1161/01.CIR.51.2.394

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