of an obstruction. This fact has not been widely appreciated, probably due to the common use of restricted lead systems. This practice appears to be gradually changing.

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References

Exercise and Human Angiograms
To the Editor:
I disagree with the conclusion of Nolewajka et al.1 Their exercise period of 7 months is too brief to have any effect on coronary angiograms, and they should not say that "exercise, therefore, does not appear to affect progression of disease."

We have observed improvement of coronary angiograms in a nonsmoking patient after 7 years of aerobic, "marathon-type" training. The patient began supervised walking and jogging at the age 61 years. He had severe angina that had been progressing since age 48 years in spite of a limited walking program. He trained daily, averaging 600 kcal until his total mileage reached 10,000 miles. Repeat angiograms at age 68 years show notable improvement. The narrowing in the circumflex branch of the left coronary artery regressed from 95% to 50% (figs. 1 and 2). The right coronary artery narrowing regressed from 75% to 30%.

It is probably relevant that this patient was a nonsmoker doing the caloric equivalent of 10 km per day. This fits our concept of the "marathoner's lifestyle" — a powerful tool in the prevention of coronary heart disease.2 We have been following 144 cardiac patients for 700 patient-years. All have finished at least one 42 km marathon. The total death rate is 1% per year. This compares favorably with the general population. This report of improved angiograms should stimulate a closer look at the growing popularity of hobby marathoning.

Acknowledgment
We are grateful to Dr. M. Sanmarco of the Cardiac Rehabilitation Program, Rancho Los Amigos Hospital, Downey, California, for the case report and angiograms showing regression of atheroma.

Thomas J. Bassler, M.D.
Editor
American Medical Joggers Association
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FIGURE 1. Left coronary angiogram (left anterior oblique projection) showing 95% narrowing in the circumflex branch in July, 1972.

FIGURE 2. Left coronary angiogram (left anterior oblique projection) showing 50% narrowing in the circumflex branch in 1979 after 10,000 miles of exercise training.

References
The authors reply:

To the Editor:

We agree with Dr. Bassler that the exercise period of 7 months may have been too short to affect progression of disease. Indeed, in our paper (page 120, paragraph 5) we stated: "... It is also possible that the experimental period may have been too brief, had we continued the study for a longer period, a change in progression of disease might have been evident."

The statement that Dr. Bassler has quoted is taken from the abstract, as requested by the editor, has been kept concise and informative. Thus, our conclusion refers only to the study population and has been softened by the phrase "does not appear." This conclusion was expanded upon in the discussion part of our paper.

The brief case report is interesting. We concur that long-term studies are essential and this is underway.

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The Editor also replies:

Dr. Bassler has submitted illustrations to support afferent regression of obstructive coronary artery lesions 7 years later. This seeming improvement is particularly convincing because it appears in two separate vessels. However, our readers are reminded of a recent editorial in Circulation emphasizing the need for extreme care in judging regression from paired angiograms.

ELIOT RAPAPORT, M.D.
Editor

Reference


2-D Echo and LA Thrombi

To the Editor:

We believe that the article by Mikell et al. does not adequately stress the limitations of two-dimensional echocardiography in the detection of left atrial thrombi in patients with prosthetic mitral valves. The majority of thrombi adheres to part of the mitral valve prosthesis and may not independently attach to the left atrial wall. Increased echoes in the region of the prosthesis due to thrombi are usually difficult to distinguish from reverberations from the prosthesis itself and the "defining characteristics" proposed by Mikell et al. may not be adequate.

We had a recent example of this problem in a patient with severe rheumatic valvular stenosis who in June 1979 had mitral and aortic Björk-Shiley prosthetic valves inserted. Her subsequent anticoagulation was complicated by two major bleeds, necessitating temporary substitution of antiplatelet agents for her Coumadin. Her Coumadin was restarted because of the high frequency of thrombotic complications in patients with Björk-Shiley prostheses off anticoagulants. However, she later sustained three separate transient ischemic attacks. On examination her prosthetic mitral clicks appeared more muffled than before. Carotid angiography was normal. A two-dimensional echocardiogram, using the same instrument that the authors describe, showed a large, dense mass of echoes extending from the mitral prosthesis and filling most of the left atrium (fig. 1). The bright echoes were present in two planes and remained despite variations in gain settings.

We are generally very conservative about diagnosing mass lesions on prosthetic valves. While some of the abnormal echoes appeared due to reverberations, we had not seen so large a mass of echoes in the region of a prosthetic valve during 4 years of two-dimensional echocardiographic experience. Because of the patient's temporary inadequate anticoagulation, muffled prosthetic sounds, transient ischemic attacks and abnormal echocardiogram, a large thrombus adherent to the mitral prosthesis was suspected and exploratory cardiotomy was carried out. To our surprise, this showed normal aortic and mitral prosthetic valves with no evidence of valvular or left

FIGURE 3. Right coronary angiogram (left anterior oblique projection) showing 75% narrowing before exercise training, 1972.

FIGURE 4. Right coronary angiogram (left anterior oblique projection) showing 30% narrowing after 10,000 miles of exercise training, 1979.
Exercise and human angiograms.
T J Bassler

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