Correspondence

Lead specificity of the maximum ST/heart rate slope response

Sir,

The letter by Beattie *et al* (1984; 53: 349) contains some interesting and remarkable statements, and a few are worthy of comment. The letter states that "the maximum rate of change of ST amplitude was a poor predictor of the extent of coronary artery disease" when using "a computerised Frank orthogonal lead system." This finding is hardly surprising; though the full details of the protocols have not been stated, it seems that this report is yet another that has used methods different from those used in the Leeds test and obtained different results. In Leeds the ST/HR slope, using conventional leads plus lead CM5, gives results after manual measurement that are still consistent with our initial experience; the maximal ST/HR slope is an accurate index of the presence and severity of myocardial ischaemia, which in the patients with anginal pain is assessed and graded according to results of coronary arteriography.

A remarkable feature of the letter on the use of the maximal ST/HR slope is the suggestion that this "assumes that the ST response to exercise is uniform in all leads and that a common pathophysiological mechanism—namely a mismatch of myocardial

oxygen supply and demand—is the sole determinant of such a response." Then the letter proceeds to destroy its own suggestion, using the well accepted contention that electrocardiographic changes are influenced by the region of the myocardium in which ischaemia occurs.

Perhaps we might be allowed to state that in our use of the maximal ST/HR slope there is no need for any assumptions to be made; but there are implications of the results. Also our up to date experience with the maximal ST/HR slope is that this slope is an index of myocardial ischaemia; it is still accurate in detecting the ischaemia as assessed by coronary angiography in a selected group of patients with angina, but it seems also in ongoing trials to be an index of myocardial ischaemia in patients without coronary constriction, for example, in patients with a dilated or hypertrophied left ventricle.

R J Linden,
D A S G Mary,
Department of Cardiovascular Studies,
University of Leeds,
Leeds LS2 9JT.

Radiographic contrast agents in angiocardiology

Sir,

Hayward and Dawson are to be congratulated on their excellent review of radiographic contrast agents in angiocardiology (1984; 52: 361-8). Their statement that "the viscosities of the new agents are all appreciably higher than those of conventional agents" is, however, at variance with their Table, which says that Niopam 370 is less viscous than Urografin 370 at 37°C. It is my impression that higher viscosity limits the delivery of contrast medium during hand injections, as for coronary angiography, but that for really high rates of delivery the degree of turbulence of flow in the catheter is more important. This means that for pump injections the length and internal diameter of the catheter are more critical to delivery than the viscosity of the contrast medium.

At present, most cardiac investigations are per-

formed without serious side effects using ionic media. The routine use of these expensive newer media can be justified only in certain subgroups of patients—for example, in pulmonary angiography, paediatric angiocardiology, and in combined coronary/carotid examinations. The new media should be made available in every department for occasional use in high risk adult patients. On occasions, however, it may become apparent during a procedure that the patient is showing adverse haemodynamic or electrocardiographic responses to an ionic medium, and it would be an advantage to be able to change to a low osmolality medium during such a procedure. I and my colleagues at this hospital have studied a number of patients for whom a change was made from ionic to another medium. In a series of 100 patients in whom iopamidol (Niopam) was given for the left ven-