discipline may evoke animosity towards the department, it is effective.

Dr J D Wigdahl's point (2 September, p 707) about urgent general practitioner requests is taken. We now accept such requests if the urgent circumstances are outlined. The report copy and the letter are reviewed by the district medical committee to ensure that the facility is not regularly abused. I certainly do not wish GPs or anyone else to adopt a laissez faire attitude to disease. I hope no one else wants radiologists to develop a Lea Thomas attitude to organ-imaging.

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Dopamine and dobutamine

SIR,—I was distressed to read the letter from Mr Alan Yates (17 June, p 1622) in which he grossly misquotes my paper.¹ Mr Yates writes that "dopamine is dependent for its effect on the release of myocardial noradrenaline,¹ while dobutamine is not." In the paper to which he refers I wrote, "Dopamine increases myocardial contractility and heart rate by direct action on β -adrenergic receptors. It also releases norepinephrine from myocardial catecholamine storage sites."

The primary difference in the haemodynamic action of dobutamine and dopamine, in my opinion, is not because of difference in direct or indirect action on the heart but because of difference in their vascular actions.² In lower doses dopamine reduces blood pressure and total peripheral resistance, in part because of direct action on specific receptors which cause vasodilatation in the renal and mesenteric vascular beds. With slightly higher doses β -adrenergic receptors are activated to increase cardiac contractility and cardiac output. In this dose range dopamine has been used successfully for the treatment of refractory congestive heart failure.¹⁻⁵ When the dose of dopamine is increased further α -adrenergic vasoconstriction could occur which would be undesirable for treatment of congestive heart failure. On the other hand patients in shock may require the vasoconstricting action of dopamine to maintain adequate blood pressure. Recent studies have shown that vasodilators such as nitroprusside may be used in combination with dopamine to decrease vasoconstriction in patients with congestive heart failure.^{2,6}

Dobutamine acts on β_1 -adrenergic receptors and exerts relatively minor effects on α - and β_2 -adrenergic receptors. Accordingly it can increase cardiac output and decrease total peripheral resistance over a wider dosage range than dopamine. In the official package insert dobutamine is recommended "for inotropic support in the treatment of heart failure. . . ." Unlike dopamine it is not recommended for treatment of shock. Because dobutamine does not have the ability to increase peripheral resistance it could cause myocardial ischaemia if the heart were stimulated at a time when blood pressure was too low to maintain coronary blood flow.

Finally, Mr Yates states that "there are strong reasons to support the experimental evidence that the inotropic action of dobutamine does not produce expansion of myocardial ischaemia following infarction." In my opinion there are inadequate data to support

this suggestion without a special precaution included in the package insert: "Particular care should be exercised when Dobutrex (dobutamine) is used in patients with acute myocardial infarction, especially with wide-spread coronary artery disease. . . ." Dobutamine, dopamine, and all other sympathomimetic amines acting on the heart can increase the oxygen consumption of the myocardium with resultant arrhythmias or extension of the infarction unless myocardial oxygen consumption is simultaneously decreased by another mechanism such as reduction in heart size.⁷ We do not have sufficient knowledge to predict the effects of dobutamine on myocardial oxygen consumption in an individual patient with myocardial infarction.

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¹ Goldberg, L I, *New England Journal of Medicine*, 1974, **291**, 707.

² Goldberg, L I, Hsieh, Y-Y, and Resnekov, L, *Progress in Cardiovascular Diseases*, 1977, **19**, 327.

³ Goldberg, L I, McDonald, R H, jun, and Zimmerman, A M, *New England Journal of Medicine*, 1963, **268**, 1060.

⁴ Rosenblum, R, Tai, A R, and Lawson, D, *Journal of Pharmacology and Experimental Therapeutics*, 1972, **183**, 256.

⁵ Durairaj, S K, and Haywood, L J, *Clinical Pharmacology and Therapeutics*, 1978, **24**, 175.

⁶ Miller, R R, et al, *Circulation*, 1977, **55**, 881.

⁷ Goldberg, L I, *American Journal of Cardiology*, 1968, **22**, 177.

* * * We sent a copy of this letter to Mr Yates, whose reply is printed below—Ed, *BMJ*.

SIR,—In reply to Dr Goldberg's letter I really feel it is not necessary to discuss the differences of opinion between us regarding the modes of action of dopamine and dobutamine, as the primary reason for my original communication was the confusion arising from the similarity between the names of these drugs. Dr Goldberg's letter underlines the fact that there are definite pharmacological differences between them. Furthermore, I certainly agree with Dr Goldberg that we do not yet have sufficient knowledge to predict or confidently define the exact modes of action of these two drugs. Their differing effects on the peripheral vascular resistance is, of course, an important point, and as cogent an argument can be made for reducing the peripheral resistance as raising it in conditions of low cardiac output. Certainly raising the peripheral vascular resistance is of great importance when it represents a risk of peripheral ischaemia and gangrene.

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Alpha-fetoprotein levels in cirrhosis and cancer of the liver

SIR,—We have read with interest the report by Dr P J Johnson and others (2 September, p 661), though we think their results are rather surprisingly in contrast to those of other workers¹⁻³ and our own findings.

In patients with cirrhosis of the liver without evidence of malignancy we found raised serum levels (>20 mg/ml) of α -fetoprotein (AFP) in 80 out of 325 cases (26%), although the levels were never higher than 300 ng/ml. In 23 cases of primary liver cell cancer (PLC) arising in cirrhotic patients the concentration was higher than normal in 22 cases (95%)

(median 18 567 ng/ml). In 11 patients with PLC arising in normal liver AFP levels were abnormal in 10 (90%) (median 35 235). Of the 22 cases of secondary liver tumours AFP concentrations were higher than 20 ng/ml in 10 (45.4%) (median 1650 ng/ml).

In our experience, and in agreement with Mr Johnson and his colleagues, in most cases of PLC in cirrhotic patients the AFP level is high, but in contrast the level is also high in 90% of cases of PLC arising in normal livers and in a high proportion of cases of secondary liver deposits, while concentrations of AFP are raised in 26% of cirrhotics without evidence of malignancy, so that this finding does not permit the prediction of an ominous outcome. The work of Dr Johnson and his colleagues must be regarded with caution, at least in geographical areas other than Britain.

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¹ Delmont, J, et al, *Digestion*, 1974, **10**, 29.

² Rouslahti, E, and Seppala, M, *Lancet*, 1972, **2**, 278.

³ Bloomer, J R, et al, *Gastroenterology*, 1973, **65**, 530.

Behçet's disease

SIR,—Although, as your leading article states (22 July, p 234), the exact aetiology of Behçet's disease remains unknown, it is clear that much of the diverse symptomatology is secondary to vasculitis.¹ In addition there is often a defect in fibrinolysis² with the development of venous thromboses and, as Dr R A C Graham-Brown has pointed out (19 August, p 570), treatment with ethyloestrenol and phenformin or with streptokinase has been shown to be of benefit. The anabolic steroid stanozolol has been shown to enhance fibrinolysis³ and to be of value in the treatment of both idiopathic recurrent thrombophlebitis⁴ and Raynaud's phenomenon.⁵ We should like to report the apparently successful use of this drug in a patient with Behçet's disease.

The patient, a 50-year-old Indian, was diagnosed as suffering from Behçet's disease in 1965 when oral and genital ulceration appeared. Subsequently he developed arthralgia and neurological symptoms and in June 1977 a deep-vein thrombosis in the left leg. Conventional therapy, including anticoagulation, did not prevent further extensive thrombotic episodes over the following six months. Investigations during this period revealed normal coagulation and platelet function studies but the resting fibrinolytic activity in his blood was reduced, as measured by a fibrin plate lysis area (FPLA) of between 25 and 40 mm² (normal 80 ± 40 mm²). In December 1977 treatment aimed at improving fibrinolysis with stanozolol 5 mg twice daily was started. Therapy has now been continuous for nine months and during that time he has had no further thrombotic episodes, although oral and genital ulceration has persisted. After six months the resting fibrinolytic activity was reassessed and the FPLA had increased to 169 mm².

The effectiveness of anabolic steroids in enhancing fibrinolysis is well recognised, though their action is often short-lived. Resistance soon develops to ethyloestrenol given alone, although when phenformin is also given a sustained action is achieved.⁶ We