are to ensure that their decisions are cost effective.

It is to be hoped that the appraisal work of Dr Hayes and his colleagues will be completed with a costing study in the near future.

ALAN MAYNARD

University Department of Economics and Related Studies,
York YO1 5DD

¹ Culyer, A J, and Maynard, A K, *Medical Care*, 1970, 8, 501.

Heatstroke in a "run for fun"

SIR,—The purpose of my letter (20 January, p 197) was to suggest that current medical literature may be inadequate on the subject of heat injury during "fun runs." The subsequent letter from South Africa is a good case in point (7 July, p 52). Professor T D Noakes and Dr L H Opie cite the monumental report of Malamud *et al*¹ to support their view that "sudden death due either to ventricular fibrillation or to cardiac arrest is not a feature of heatstroke." However, Malamud *et al* specifically excluded all instantaneous deaths from their study by limiting their cases to those collected from military hospitals and omitting 43 with inadequate clinical information. Instantaneous deaths and deaths soon after admission were not included. Thus, they do not touch on the question of sudden death due to heatstroke. Their pre-1946 report contained only a few electrocardiograms; but the necropsy finding of "fragmentation or rupture" of cardiac muscle fibres was present in "well over one-fourth of the cases"—a finding consistent with ventricular fibrillation.

I had hoped that we would not limit our concern to the "stroke" aspect of exertion-induced heat illness. The interplay of thermal damage, dehydration, and electrolyte disturbance can present as damage to one of several organs: kidneys, brain, heart, liver, or skeletal muscle. At necropsy, however, many tissues are damaged.

There have been three marathon-related deaths in the United States: the Boston *brain* death with six weeks' survival, a patient with *renal* failure who survived one week, and an instantaneous death due to *cardiac* arrest. The necropsies ruled out underlying organic disease in all cases. Although these three men could be described with Knochel's terms of "highly competitive, inexperienced, and over-enthusiastic,"² I believe that the sanctioning bodies should share some of the responsibility. At Boston they have, and this is now one of the safest marathons—with water every mile.

The scene in 1973 at Boston was quite different, however. Unregistered runners swelled the ranks to 1500. The race started at noon after an extremely unfavourable increase in heat and humidity. "International rules" stated that a runner could be "disqualified" if he accepted fluids from any source other than the "official tables." We gathered, sweating profusely, under a bright sun. The first water table was over 10 km away—holding only a fraction of the cups needed. About 500 runners, a third of the field, could not finish the 42 km. Fifty required medical care in hospital, five stayed overnight, and one died about six weeks later.

I regret that Noakes and Opie are not happy with my use of the term "heat stroke" in these cases. This disagreement is purely academic. I will accept any term they might

use for this syndrome of "multisystem damage during the marathon" so long as the preventive measures are the same as those for heatstroke.

T J BASSLER

American Medical Joggers Association,
Centinela Hospital,
Inglewood, California 90307

¹ Malamud, N, Haymaker, W, and Custer, R P, *Military Surgeon*, 1946, 99, 397.

² Knochel, J P, *Archives of Internal Medicine*, 1974, 133, 841.

The haematuria of the long-distance runner

SIR,—Your leading article (21 July 1979) does not contain any information about the frequency of haematuria after heavy exercise.

It may interest you to know that urine examinations just after the finish of the Norwegian marathon championship in summer 1978 showed that, of 41 participants being able to void a urine specimen within two hours, 13 showed a positive test (the method used was the Boehringer-Mannheim test-5L). Of the 13 positive tests, seven showed signs of erythrocytes, and six of haemoglobin. Control samples of the urine of these 13 runners one week after the competition showed completely negative test results. In addition to the 13 showing haematuria, three also had glucose in the urine after finishing, and these also had negative results in the control tests a week later.

I think that the phenomenon is more innocent than is suggested by your statement that "the doctor should assume that any haematuria . . . is due to underlying urinary tract disease until proved otherwise."

TORRE HEIDE

Rogaland,
Stavanger, Norway

Alcohol-dependent doctors

SIR,—Your leading article "Alcohol-dependent doctors" (11 August, p 351) refers favourably to the non-coercive New York state system to help the impaired doctor. The pilot scheme for anaesthetists based on these principles and initiated by the Association of Anaesthetists of Great Britain and Ireland and the Royal College of Psychiatrists (17 February, p 496) has only been operating for a short time. It seems already apparent that the scheme fills a gap in the present procedures and could usefully be extended to other branches of medicine.

M ROSEN

Honorary Treasurer,
Association of Anaesthetists of Great Britain and Ireland

London WC1H 9LG

SIR,—Your leading article about alcohol- and drug-dependent doctors (11 August, p 351) is timely, because both patients and doctors need to be protected from the effects of one of the most insidiously growing threats to modern society. By admitting affected doctors to an institution it is comparatively easy today to stop them indulging themselves, but apart from this mere incarceration there is unfortunately little in the way of specific therapy that can be offered to them—which may well explain their readiness to discharge themselves against medical advice.

The results of current treatment in this

field are depressing, but nevertheless on historical grounds it can reasonably be expected that some spectacular breakthroughs in the management of diseases of the mind are long overdue. Until, however, such benefits accrue unquestionably the most important part of management is rehabilitation. In this context possibly the most vulnerable to poor management are young doctors who have not had time to put down roots—namely, junior hospital staff and assistants in general practice. In these cases the usual prelude to treatment is summary severance of whatever tenuous connections they may have formed within the community, with rehabilitation consisting of a rudderless drift from one unhappy locum post to another until some disaster renders successful and complete recovery a highly improbable eventuality. Like some of our learning-disordered children these hapless doctors are literally at the mercy of their environment.

Monitored treatment should therefore prove doubly helpful by ensuring that management as well as progress is properly supervised, because it should not be entirely forgotten that every doctor who is dependent on alcohol or drugs (or both) is somebody's very sick patient.

GWYNNE V LEWIS

PETER RAWLINSON

Health Department,
Ipswich Health District,
Ipswich, Suffolk IP1 1HB

Extracranial-intracranial anastomoses

SIR,—I was pleased to see the recent articles (7 July, p 2 and 18) and the letter (11 August, p 388) about extracranial-intracranial anastomoses: they reflect an increasing interest in this new and important neurosurgical procedure, and help, as Mr A K Keith Frazer says in his letter, to introduce the concept of cerebral revascularisation to a wider medical public.

May I make a plea to all those who ask for a biopsy of the superficial temporal artery and to those who frequently divide it not to do so until they have completely satisfied themselves that there is no alternative? The superficial temporal remains the most useful artery for cerebral revascularisation, and its absence can cause major technical problems.

Although it is 12 years since Professor Yasargil and Dr Donaghy performed the first anastomoses on patients, many questions remain to be answered about which patients are suitable for the procedure and what short-term and long-term benefits they can realistically expect from it. I believe that the answers can come only from neurosurgeons, neurologists, and neuroradiologists working closely together. To this end teams from Newcastle and Manchester have been participating for more than a year in the International Co-operative Study of Extracranial-Intracranial Arterial Anastomosis directed by Professor H J M Barnett of the University of Western Ontario. The results of this trial will be of interest to all concerned in the management of patients with cerebral ischaemia.

As Mr Keith Frazer also points out, extracranial-intracranial anastomoses are being increasingly frequently performed for conditions other than cerebral ischaemia. Clearly the full potential of this procedure, which, it must be acknowledged, is neurosurgical

rather than vascular, is yet to be discovered, and these discoveries will lie in the hands of neurosurgeons who have learnt the appropriate microvascular skills.

CARYS M BANNISTER

Department of Neurological Surgery,
North Manchester General Hospital,
Manchester M8 6RB

On-demand analgesia equipment

SIR,—The recent paper by Dr W D White and others (21 July, p 166) concerning on-demand analgesia using a Janssen (JS10299) demand analgesia computer prompts us to comment on other equipment available for this purpose. Following an earlier paper describing a patient-controlled system for pain-relief during labour¹ we purchased the commercially available equipment—a Cardiff Palliator manufactured by Pye Dynamics Ltd. After extensive experience in the labour ward we concluded that there were three major design deficiencies with regard to patient management and safety.

Firstly, the dose of analgesic administered to the patient on demand is controlled by a three-place thumbwheel digital switch variable from 0 to 999 mg. This is accessible to anyone who can touch the machine. Since "if there is a button to be pressed, someone will press it" a safeguard was needed. Our choice of analgesic agent was diamorphine, as plasma concentrations achieved could be measured by immunoassay; the dose was 3 mg; and a change of only one space on the control—that is, from 003 to 013 mg—could have had serious consequences. We have placed a simple Perspex shield with three vertical slits over the whole switch. The settings can now be altered only by inserting a narrow metal peg kept with the machine. An equally important point is that the total dose indicator is reset by a simple push button below the dials. As this gives the only indication of how much drug the patient has received in the course of labour, any accidental resetting would wipe out the only record available. This button has been cut flush to the surface and resetting can be achieved only by using the metal peg. From the photograph available it appears that similar thumbwheel settings are used on the Janssen machine. What are the safeguards?

Secondly, there is no way of programming our machine so that a maximum total dose is not exceeded. The amount the patient is given per demand is dialled in, as is the time interval between demands. However, in a prolonged labour the patient could go on making repeated demands until the syringe is empty. If the syringe is refilled, the patient can make further demands. An added safeguard whereby a maximum permitted dose could not be exceeded was, in our opinion, vital. A small unit was designed by IRC; this has a two-place thumbwheel switch into which the maximum dose desired is dialled. Again the safety shield necessitates the use of the metal peg for setting. Once this preset total dose has been reached the syringe is halted and will continue to be used only if a larger dose is then dialled in. While the Janssen machine can apparently be set to a maximum dose delivered in any hour, can a maximum total dose also be set?

Thirdly, a successful demand for analgesia by the patient is indicated by a demand light coming on. This will continue to show until the minimum time interval dialled into the

machine is reached. For example, if the machine is set so that the patient can obtain only one dose of analgesic agent in 20 minutes then the light will show for this interval. However, an observer entering the labour room and seeing the light on does not know if it has been on for one minute or 19 minutes. Similarly, when the light is off it is not possible to know, other than by the patient's memory, whether it has been off for a minute or an hour. Such clinically useful information should be available—for example, a patient approaching full dilatation or requiring a general anaesthetic. We have designed an electronic timer unit with three digital displays. The first indicates total elapsed time from the first demand for analgesia, the second displays the time interval since the last demand, and the third gives the time interval of the demand before that. For women in labour these more detailed data are necessary for patient management. The Janssen machine apparently provides a printer, and this is a reasonable alternative. However, printers are prone to mechanical failure and usually more expensive to buy. How is information obtained if the printer fails?

When new equipment is described for patient care it would be useful, especially if it is to be patient controlled, if the authors would give comprehensive details of the equipment and their opinion on its suitability for the task it is claimed to do. In our opinion the commercial equipment we purchased had some deficiencies which we have corrected. However, the time and effort needed were considerable and we would hope to pass on these benefits to other users. The Janssen equipment may have got over some of these difficulties but it would be nice to be certain. And at what cost?

TOM LIND
R G WEATHERSTONE
I R CHAMBERS

MRC Human Reproduction Group,
Princess Mary Maternity Hospital,
Newcastle upon Tyne NE2 3BD

¹ Evans, J M, *et al*, *Lancet*, 1976, **1**, 17.

Splenectomy for massive splenomegaly

SIR,—We would like to comment and expand on some of the statements in your leading article (4 August, p 293). Massive splenomegaly is encountered as part of the clinical picture in a number of diseases as indicated, but it may in addition be the only presenting manifestation without the usual accompanying signs of the underlying disease. Recently we have seen two patients who complained only of abdominal pain and who had splenomegaly at least 16 cm below the costal margin. Neither had lymphadenopathy or other abnormalities on physical examination; chest radiographs were normal. Bone marrow biopsy revealed the microscopical appearances of Hodgkin's disease in one case and of non-Hodgkin's lymphoma in the other.

Plain abdominal radiographs, radionuclide scans, and ultrasound can confirm the diagnosis of splenomegaly but occasionally may give misleading results. In a recent case which we have seen, the spleen was thought to extend 17 cm below the costal margin; the appearances of massive splenomegaly were shown by each of these investigations. However, laparoscopy, an investigation you do not mention, revealed the organ to be the enlarged

left lobe of liver; subsequent histology showed cirrhosis. The spleen did not extend below the costal margin.

No mention is made of the use of radioisotope studies to determine the sites of red cell destruction and of extramedullary erythropoiesis in attempting to predict the value of splenectomy in patients with myelofibrosis. In a few such patients radiotherapy to the spleen can be beneficial, particularly when the patient is not fit for or refuses splenectomy; it does not preclude splenectomy at a later date.

In the final paragraph some complications of splenectomy are mentioned, but it is not clear that some of the comments refer to splenectomy in general while others refer to the complications of removing a massive spleen. Splenectomy for staging in Hodgkin's disease carries a mortality of less than 0.5%, rather than 15%.¹

Postsplenectomy thrombocytosis may be marked in degree and persistent for months or years; but the potential thrombotic complications depend on a number of factors, and few of these are defined at present. We have observed the changes in the platelet count after staging splenectomy in 25 patients with Hodgkin's disease. Thrombocytosis reached a maximum in the second week after splenectomy and subsided in one to two months, and in no case did the count exceed $1000 \times 10^9/l$. Thrombotic complications were not seen and anticoagulants were not given. In one series of 318 patients undergoing splenectomy for conditions other than myeloproliferative disease, postoperative thrombocytosis was not associated with a significantly increased risk of thromboembolism.² Hirsh and Dacie³ showed that the occurrence of severe postsplenectomy thrombocytosis depended on whether or not the patient remained anaemic after operation. It is clear that the complications and risks of splenectomy vary with the underlying disorder as well as with the size of the spleen.

DOUGLAS SHAW
G RANKEN TUDHOPE

Department of Pharmacology and Therapeutics,
Ninewells Hospital,
Dundee DD1 9SY

¹ Miller, J B, and Ultmann, J E, in *Hodgkin's Disease*, ed M J Lacher, p 44. New York, Wiley, 1976.

² Boxer, M A, Braun, J, and Ellman, L, *Archives of Surgery*, 1978, **113**, 808.

³ Hirsh, J, and Dacie, J V, *British Journal of Haematology*, 1966, **12**, 44.

SIR,—Your leading article (4 August, p 293) on splenectomy for massive splenomegaly presents a somewhat superficial view of this not uncommon clinical problem. In recent years many of the effects of the "big spleen" syndrome have been well described and it is now necessary to define more specifically those haematological problems which provide convincing evidence for splenectomy. For example, the anaemia associated with splenomegaly may be due to a combination of splenic red cell pooling, splenic haemolysis, and plasma volume expansion, mechanisms that can be assessed by isotopic techniques in most large hospitals. Surely the concept of hypersplenism, useful as it was 30 years ago, has now been replaced by a better understanding of many of the physiological and pathological results of splenic enlargement.

All would agree that while the haematological changes provide the strongest indications for splenectomy there are also powerful reasons for removing the very large spleen when it has become an intolerable and cumber-