bearing-down reflex had been abolished, because these mothers exhibited the least accumulation of metabolic acidosis (those epidural mothers who retained the bearing-down reflex were rather more acidotic because, presumably, of the greater exertion involved).³ The important point, however, is that at each designated duration of the second stage the "epidural" infants were less acidotic at delivery than were the "non-epidural" infants.

It appears from the reports of their studies^{4,5} that Professor Derom and his colleagues found no significant difference in the acid-base state of neonates referable to epidural analgesia, but they did not introduce into their analysis the duration of the second stage as a variable factor. I would contend that in the circumstances under review it is the contrast between the absolute values of neonatal acidosis which is of importance, and not the difference between the values of feto-maternal gradients.

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¹ Pearson, J F, and Davies, P, *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1974, **81**, 971.

² Pearson, J F, and Davies, P, *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1974, **81**, 975.

³ Pearson, J F, and Davies, P, *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1973, **80**, 218.

⁴ Thiery, M, et al, *European Journal of Obstetrics, Gynaecology and Reproductive Medicine*, 1977, **7**, 181.

⁵ Vroman, S, et al, *European Journal of Obstetrics, Gynaecology and Reproductive Medicine*, 1977, **7**, 159.

Analgesia in terminal malignant disease

SIR,—Drs C Drinkwater and R G Twycross (5 May, p 1201) gave a pertinent account of how good analgesia can be achieved by the oral route in nearly all cases of advanced malignant disease so long as there is undeviating adherence to a four-hourly regimen and a more venturesome approach to the dosage than most of us have been brought up to expect. Our experience at Michael Sobell House certainly bears this out; and we likewise find no place for the traditional *BNF* Brompton Mixture, which lacks flexibility. It is simpler to vary the required dose of morphine or diamorphine in a standard 10 ml of chloroform water.

There remain, however, a small number of patients who find relief only from injections, usually because of intractable vomiting, severe dysphagia, or sometimes simply because no other method seems to work. Frequent injections for any length of time, however, can themselves be an ordeal, especially for a patient who has already lost much weight.

The Pye syringe driver designed by Dr B M Wright for the Medical Research Council overcomes these problems by providing a means of giving a continuous subcutaneous or intramuscular infusion of morphine or diamorphine over a prolonged period (our longest was six weeks with only one change of injection site). The instrument is simple to use, effective, reliable, foolproof, and, being small and lightweight, allows complete mobility, since it is carried in a fabric arm holster. After an initial intramuscular loading dose has been assessed and given, steady optimum analgesia is maintained, free from the peaks and troughs which follow intermittent injections. The rate of administration may be

readily varied by the attendant but not the patient. We have found it convenient to reload once daily (a great boon in domiciliary practice), and total doses have varied from 50 mg to 360 mg of diamorphine in 24 hours.

The patient receiving 360 mg daily suffered exceptional pain from a bronchial carcinoma and was also our longest user. He remained ambulant to the last day of his life.

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Relief of postoperative pain

SIR,—We have been following the correspondence on this subject with interest because for the last six months we have been using slow infusion of pethidine for this purpose. Our procedure is so simple that, although our observations are uncontrolled, we think they are sufficiently promising to justify a brief preliminary report.

We give 1.3 mg/kg in 10 ml by slow intramuscular infusion over an eight-hour period, using a Pye syringe driver, so that even if through some mischance the whole dose were injected at once it would have little more effect than a normal four-hourly dose of 1 mg/kg. We do not therefore have to worry about respiratory depression or stop the infusion during sleep, as suggested by Scott.¹ The infusion is started as soon as the patient leaves the theatre, so that by the time full consciousness returns the blood concentration has reached an effective level.

The evidence for its effectiveness is that none of the 12 patients so far treated has complained of serious pain and most have been sleepy throughout the infusion. The infusions have been given only for the first eight hours after operation and no attempt has been made to vary the rate of infusion according to the patient's response, but this could very easily be done. We feel that this procedure is so simple and safe that it is suitable for use by nurses and that the more complex and labour-intensive systems advocated by Scott,¹ Fry,² Church (14 April, p 977), and Rosen and Vickers (12 May, p 1278) are probably unnecessary, though demand analgesia may well be desirable in obstetrics.

A fully controlled trial of the method, carried on for longer periods and including varying the rate of infusion according to the patient's requirements, is in progress and the results will be reported in due course.

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¹ Scott, J S, *American Journal of Obstetrics and Gynaecology*, 1970, **106**, 959.

² Fry, E N S, and Desphande, S, *British Medical Journal*, 1977, **2**, 870.

SIR,—In reminding us of the efficacy of self-administered narcotics for the treatment of pain in labour I think that Drs M Rosen and Professor M D Vickers (12 May, p 1278) may be mistaken in extending their experience to the treatment of postoperative pain.

The patients on whom they, and others, have based their experience are an entirely different group from those patients suffering from postoperative pain. The former are fit,

young, rational women experiencing intermittent pain, the interpretation of which is subject to an unpredictable psychological overlay. The postoperative patient—particularly the one for whom severe pain may increase morbidity—is in an older age group undergoing a stressful event at an age when he is less well equipped, physiologically, to cope with this stress. Psychologically, however, he may have considerably more resolve than the younger group. For these patients a self-triggered analgesic regimen would seem inappropriate, particularly in the immediate postoperative period, frequently a time of relative confusion and non-cooperation fuelled by postoperative hypoxia, cardiovascular instability, and inevitable polypharmacy. I have my doubts whether many of them could rationalise sufficiently to manage their own pain relief. Furthermore, the self-regulation technique must lead to swinging blood levels of analgesic similar to the intramuscular route, although of course the amplitude will be smaller.

I was therefore particularly interested to read that Dr Rosen and Dr Vickers are using a patient demand device for postoperative patients and that they have found that demand is reduced quickly over the first 24 hours. In my experience postoperative pain increases during the first 12 hours, then remains steady for a further 12 hours, and only starts to decrease later the second day. I put this down to the elimination of residual effects of anaesthesia, to wound oedema, and to early mobilisation. Hence I make provision for at least 36 hours' analgesia. Dr Rosen and Professor Vickers point out that this may lead to overkill and overdosage—quoting two cases from my paper (14 April, p 977). These two patients were, as I stated, receiving morphine 0.03 mg/kg hour and not pethidine 0.3 mg/kg/hour; the cases occurred within four hours of returning to the ward and were spotted early by the nursing staff when the respiratory rate reached 10 per minute. I have used pethidine 0.3 mg/kg/hour in over 500 cases and overdosage has not occurred in any of them.

I would also add that although the technique I described was devised and first used in Australia it appears to work equally well in this country with a matching enthusiasm from the nursing staff. Finally, I know we must all swim with developments in microelectronic technology, but human contact cannot be bad and it is that too which is provided by close supervision from the nurses.

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Seat-belt legislation

SIR,—It is to be regretted that the Government has declared that it has no plans to introduce a new Bill on the compulsory wearing of seat belts (announced in a written answer in the Commons on 25 May 1979). This decision appears to have been taken without any further serious consultation with interested parties, either pro or con.

It is now up to the BMA and the Royal Colleges of Surgeons to take this matter up at the highest level in Government. The possibilities of saving some 1000 lives and 10 000 serious injuries per annum are not to be trifled with on the grounds that seat-belt legislation

would infringe on the freedom of choice of the individual. Nor can the argument about difficulties in enforcement be used as an excuse, since infringement is so easy to detect. When seat-belt legislation was introduced in the State of Victoria¹ the majority of people complied without enforcement being necessary.

The Australian experience has a number of other useful lessons for us. It was only as a result of strong pressure from the doctors that seat-belt legislation was introduced. In Victoria all road traffic accident casualties are required by law to have a blood alcohol test taken. This has allowed a much more accurate appraisal to be made of the very significant contribution of alcohol to the road accident problem.

We may well have a good record in road accident deaths and injuries when compared with other countries. We have also made a great deal of progress in road safety. There is still so much more that we could do by relatively simple legislation and by tightening up of some of our existing laws.

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¹ McDermott, F, *Annals of the Royal College of Surgeons of England*, 1978, **60**, 437.

Rheumatoid arthritis and the gut

SIR,—As a supplement to your leading article on rheumatoid arthritis and the gut (28 April, p 1104) I would like to report my results on the development of rheumatoid arthritis based on longitudinal investigations of several thousands of cases of infections with *Yersinia enterocolitica*, serotype 3.

My observations derive from an area in which *Y. enterocolitica* infections are endemic. Extensive population studies indicate that there are about 250 000 new cases per year in this country. Most of them present as enteritis or mesenteric lymphadenitis or both.^{1,2} The infection is to a high degree self-limiting. Some people—and not only those of the tissue type HLA B27—develop complications of the acute intestinal infection one to three weeks later. These complications present as reactive inflammations, especially in the joints and the skin (connective tissue), but might also present as thyroid disease, glomerulonephritis, or inflammation of the eye. The complication rate is not finally settled but can be estimated as about 5%. Most of the cases seen in hospital are of the arthritis types, both rather mild cases of a few weeks' duration and acute, fulminant cases of polyarthritis of several years' duration. The latter are usually associated with the HLA B27 tissue type.

On the basis of longitudinal studies (<8 years) of hundreds of such cases it is now clear that some of them do not remit but—over months and years—develop into rheumatoid arthritis, some also with the development of rheumatoid factor.^{3,4} It can be estimated that such cases account for about 1 per 1000 of those with the primary infection. Longitudinal serological investigations of old-established cases of seropositive rheumatoid arthritis reveal that *Y. enterocolitica* infection is involved in more than 70% of the cases.⁵

With regard to the connection between HLA B27 and *Yersinia* infection it must be emphasised that the acute intestinal infection does not appear only in persons of this tissue type. All sorts of people and age groups, and both sexes, are involved. If a person of that tissue type, however, is infected he has a very

high risk of developing a high-titre, severe arthritis, usually of long duration. If the case develops into a chronic one it will usually appear as the spondylitic type. As a whole the B27 *Yersinia* cases appear as the top of the iceberg of *Yersinia* complications.

In conclusion, it can therefore be said that my findings support the conception of rheumatoid arthritis as a primarily enteropathic arthropathy. My findings are based on observations of the effects of an established arthritogenic micro-organism, in contrast to most other aetiological observations, and they clearly demonstrate the development of an acute enteric infection into the complication of an acute reactive arthritis, which in turn develops into a chronic reactive arthritis (rheumatoid arthritis or ankylosing spondylitis).⁶

My hypothesis is that these findings on *Yersinia* infection (the *Yersinia* model) might be applicable to similar infections prevailing in other areas—streptococcal and *Neisseria* infections, salmonellosis, shigellosis, and brucellosis.

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¹ Larsen, J H, *Ugeskrift for Læger*, 1975, **137**, 565, 570.

² Larsen, J H, *Ugeskrift for Læger*, 1977, **139**, 2627.

³ Larsen, J H, Jarner, D, and Jarlov, N V, *Ugeskrift for Læger*, 1977, **139**, 1478.

⁴ Jarner, D, Jarlov, N V, and Larsen, J H, *Ugeskrift for Læger*, 1977, **139**, 1481.

⁵ Larsen, J H, in *Infection and Immunology in the Rheumatic Diseases*, ed D C Dumonde, p 133. Oxford, Blackwell Scientific Publications, 1976.

⁶ Larsen, J H, *Contributions to Microbiology and Immunology*, in press.

Endoscopy for all?

SIR,—The results of the one-visit endoscopic clinic reported by Dr A K Beavis and others (26 May, p 1387) are interesting, but perhaps optimism about such a service should be guarded.

Although Dr Beavis and his colleagues state that only 30% of the results of investigations were normal, on closer examination only in 23 (12.5%) was either an ulcer or a cancer found. This is less than in our recently reported direct referral system for general practitioners (17 February, p 457), which avoided hospital consultation altogether. Most of the other diagnostic groups mentioned are arbitrary, open to observer variation, and probably not related to symptoms. We followed up a group of such patients (see accompanying table) and found that they did not behave differently from those with completely normal findings.

Finally, it is known that investigation of dyspeptic patients is unrewarding under the age of 55,¹ and it is worrying that, while nearly 60% of the patients were under 45 in this study, only five out of the 205 referred to the clinic avoided endoscopy. These findings confirm ours: that is, by making endoscopy more readily available one is merely attracting the younger dyspeptic patient who previously

avoided investigation. There is no evidence that those patients with more sinister pathology are seen earlier in the course of their disease.

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¹ Mead, G M, et al, *British Medical Journal*, 1977, **1**, 1461.

What shall we teach undergraduates?

SIR,—It is astonishing that in their recent article on the teaching of undergraduates (24 March, p 805) Professor V Wright and his colleagues made no mention of radiological anatomy.

Throughout a period of rapid and sometimes drastic changes in the medical curriculum, including a notable decline in the value placed on the teaching of anatomy, one crucial fact appears to have been almost universally ignored. In the same span of time there has been an enormous increase in the development and utilisation of imaging techniques of all kinds, fundamental to which is a secure basis of anatomical knowledge. It follows that the study of anatomy is not less important than was previously the case but—quite the contrary—is of greater importance than ever before. Yet the time allocated to it in some centres could now be said to approach vanishing point compared with past allocations, which ranged from five full terms to three academic years.

There seems to be a growing impression among anatomists, clinicians, and radiologists that the process of change in our medical schools may have been taken too far and too fast, for there is agreement that the general level of anatomical knowledge shown by our young graduates does not measure up to the standard required in day-to-day hospital practice. This discovery is made at least twice a year in x-ray departments throughout the country, whenever a new intake of house officers appear on the scene. It is all too often crystal-clear to the radiologist and his colleagues that, however well the many lists of diagnostic options have been taught and memorised, there is no firm foundation of normal radiological anatomy against which possibilities can be construed as either probabilities or certainties. This order of deficiency illustrates the essential difference between training and education.

The problem is of such proportions that, in many x-ray departments, more queries currently arise from ignorance of radiological anatomy, of the wide range of normal appearances, and of normal variants which can simulate disease than from specific pathological conditions. A study carried out by John F Holt, director of radiology at the University of Michigan, has shown that questions concerning radiological anatomy outnumber those regarding pathological entities by three to one.¹

Six-month follow-up of patients undergoing endoscopy for dyspepsia, excluding ulcers and cancers

Endoscopic diagnosis	No	% with continuing symptoms	% on antacids	Alternative diagnosis
Normal	100	66	52	4%
Hiatus hernia	50	64	50	4%
Gastritis	50	62	64	4%
Duodenitis	50	64	60	8%