243 kPa (2·4 atmospheres absolute) 100% oxygen for 90 minutes three times daily for the first day and twice daily thereafter.[5] In cases of surgical delay for any reason and in cases in which the decision is taken not to operate, hyperbaric oxygen should be used immediately if it is available; this may also assist in distinguishing viable from non-viable tissue at subsequent surgery.

The availability of hyperbaric oxygen facilities in Britain can be checked with the hyperbaric unit at Whipps Cross Hospital, London E11 1NR (tel 0181 539 5522, extension 5150).

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Overdosage during patient controlled analgesia

Mount syringes vertically . . .

EDITOR,—D A Southern and M S Read report on a patient who received an overdosage of opiate while using patient controlled analgesia.[1] Such an overdosage is not, however, a specific consequence of this technique but can occur with any infusion syringe, so it is not only anaesthetists who need to be aware of this risk. Infusion of insulin, for example, could be equally dangerous and might similarly be given in relatively low dependency areas.

Such events must be rare, but the fact that they may happen with a damaged syringe has been unequivocally shown.[2] In this latest case the syringe was "normal on close examination." When I duplicated the administration set used I found that perforating the 50 ml syringe plunger with a 20 gauge cannula resulted in virtually free flow, given a gravitational advantage of as little as 5 cm. Such a small leak might not be apparent on visual inspection, but ideally the syringe that was used should also be tested under pressure and the remainder of that batch looked at by the manufacturers. Failure to examine formally the relevant equipment means that the one reported lethal case of overdosage with patient controlled analgesia remains unexplained.[3]

Infusion syringes are frequently mounted horizontally and at some height above the patient. In such an orientation an airlock should develop before the syringe is competely emptied. The outcome would probably have been far worse if the syringe had been mounted pointing downwards. This situation is often exacerbated by the omission of antisyphon valves.

The solution is always to mount syringes vertically with the outlet uppermost at or even below the level of the heart, but despite such precautions an apparently fail safe system can still fail. Perhaps we should consider reverting to one of the early precepts of patient controlled analgesia—namely, that the syringe should contain only a "survivable dose."[2] In Nottingham, for example, when using morphine we use 60 mg in 60 ml, though more frequent changes of syringe then carry their own potential for operator error.

Patient controlled analgesia (and, by implication, other infusion techniques) has a good safety record,[4] but current practice is far from ideal. We should recognise that syphoning is a practical as well as a theoretical risk with any infusion syringe. Despite these problems, if the measures suggested above are used we can still hope to see this technique proved to be more effective than, or at least as safe as, the alternatives.

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. . . and below the level of the patient

EDITOR,—It is helpful to be reminded of the dangers of siphonage from patient controlled analgesia devices[1] or, indeed, from any raised fluid reservoir in continuity with a patient's venous system. The valve that D A Southern and M S Read describe, however, is a one way valve. It would not prevent siphonage from a syringe raised any great height above a patient. If the syringe is placed at or slightly below the level of the patient, as in the lower drawing in the figure in the paper, the valve would prevent the back flow of blood in the event of the syringe leaking—that is, it would prevent back siphonage but not forward siphonage. This seems a practical and safe arrangement as the other suggestion of placing the syringe with its outlet at the top is often difficult. We commonly use syringe pumps to deliver opioid infusions in our children's wards; these pumps usually do not have locked controls. If the syringe pump is at a low level some form of "antihandling" device should be incorporated to prevent toddlers amusing themselves.

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Follow manufacturers' instructions

EDITOR,—Siphoning from the syringe of a patient controlled analgesia device into the patient, reported by D A Southern and M S Read,[1] is a well known potential problem and was first clearly described by Thomas and Owen.[2] Southern and Read quote this reference but do not give due explanation.

I was surprised to find that this "lesson" emanated from my department as we do not undertake orthopaedics or use the Graseby PCAS machine in our hospital; it is therefore misleading of the authors to give the impression that this problem occurred in the University Hospital of Wales. The acute pain service at the University Hospital of Wales treats between 2000 and 2500 patients with patient controlled analgesia each year, and we always use both antisiphon and unidirectional valves on our infusion lines for patient controlled analgesia. This has been our policy since the formation of the acute pain service in 1990. It is unfortunate that colleagues working in another unit in Cardiff were not aware of this problem.

This lesson is well known to those who regularly provide patient controlled analgesia, and most, if not all, manufacturers of patient controlled analgesia machines supply suitable infusion sets with protective valves included. If the correct equipment is used the authors' proposal that the outlet of the syringe should be positioned uppermost is unnecessary and, indeed, encourages others to ignore the safety measure of including an antisiphon valve.

Surely in this case the lesson should be: if you are going to use a piece of equipment it is wise to read the instructions and understand what you are doing.

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1 Southern DA, Read MS. Overdosage of opiate from patient controlled analgesia devices. *BMJ* 1994;309:1002. (15 October.)
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Authors' reply

EDITOR,—The incident that we reported did indeed occur at a different unit in Cardiff, and not at the University Hospital of Wales. Siphoning is well known to acute pain specialists but is unfamiliar to others—hence the need for a Lesson of the Week. An informal survey that we performed in 1993 showed that only a minority of hospitals in which patient controlled analgesia is used use antisiphon devices. Most use cheaper "minimal volume" infusion lines instead. We agree with Michael Harmer that those who use any item of equipment should read the instructions and know what they are doing, but as patient controlled analgesia equipment has proliferated to many low dependency areas it is being used by staff who are less familiar with this technology. It is therefore more important than ever that the equipment itself should incorporate the highest standards of safety. We believe that antisiphon valves are mandatory and should be complemented by other safety features, including having the syringe with its outlet uppermost. Our report was of a malfunction in a mechanical device: it is not impossible that some future case report will describe a malfunction in an antisiphon valve.

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Circadian variation in deliberate self poisoning

EDITOR,—Roberto Manfredini and colleagues present data showing circadian variation in the incidence of deliberate self poisoning as determined by assessment of admissions to an Italian accident and emergency department.[1] I am concerned, however, by their conclusion that "treatment of depressive disorders might therefore be improved by aiming for peak drug concentrations at vulnerable times."

A large proportion of their patients would not have been suffering from a depressive disorder and would therefore have been unlikely to benefit

from antidepressants. Commonly, patients with moderate or severe depressive disorder suffer prominent low mood in the morning, with their mood lifting towards evening. Thus the observation that deliberate self poisoning peaks in the early evening is unlikely to be due primarily to depressive disorder. The patients studied are likely to vary in motive and psychopathology, but these were apparently not assessed.

The half lives of different antidepressants and their active metabolites vary widely, as do their absorption and elimination in different subjects. These factors make the prediction of the time of peak plasma concentrations difficult. In addition, there is little evidence that mood and suicidal behaviour are correlated with diurnal variations in serum antidepressant concentrations. Much more important are the detection and effective treatment of the depressive disorder if one is present. Recent studies in primary care have shown poor skills in detecting depressive disorder and in treating such disorder effectively—that is, giving sufficient dose of an antidepressant for sufficient time—and poor compliance.[2-4]

Finally, the extrapolation of the results of observational studies on deliberate self harm to different countries is problematic. A recent comparison of the characteristics of people who harmed themselves in Oxford and Utrecht showed significant differences in age, incidence of socioeconomic problems, and incidence of psychiatric and personality disorders.[5] The implication is that the threshold for and nature of self harm may vary among nations, making conclusions regarding prevention drawn from observational studies specific to the population studied.

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Managing sharps injuries

EDITOR,—Ruth R White and Elisabeth J Ridgway show considerable variation in the management of sharps injuries both between and within hospital departments and emphasise the importance of clear and consistent advice and appropriate intervention and follow up.[1] Although they allude to the need to reduce the number of sharps injuries, they do not specifically comment on some of the enduring problems of preventing and managing them—namely, poor uptake of hepatitis B immunisation and failure to report sharps injury, particularly among doctors.

A survey of all doctors employed by South Glamorgan Health Authority between August 1990 and February 1991 indicated that only 27% of respondents were fully immunised against hepatitis B.[2] The main reason for non-immmunisation was a low perception of risk; the main reasons for incomplete immunisation were forgetfulness and job movement.

A further survey of this cohort found that as few as 5% of needlestick injuries were reported.[3] Doctors who were not fully immunised against hepatitis B were no more likely to report incidents than those who were fully immunised. The reasons for non-reporting included a low perception of risk or of the importance of the incident, insufficient time, and unfamiliarity with reporting procedures.

Proper management of sharps injuries depends on good reporting. Without it prophylaxis after exposure, counselling, and follow up are likely to be inadequate. The requirement that health care workers involved in procedures that are prone to result in exposure must be able to show immunity against hepatitis B means that many more doctors are probably immunised than hitherto, but doctors' complacent attitudes to the health and safety hazards of sharps injuries are still a cause for concern. Doctors' perceptions of low risk patients have been shown to be inaccurate.[4] Doctors clearly need to be better educated about the importance and desirability of prompt reporting of all sharps injuries.

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Matching inhalers and spacer devices

EDITOR,—Concern has been generated by the pharmaceutical industry about inhalation treatment and large volume spacer devices in advertisements in the *Pharmaceutical Journal*.[1,2] General practitioners and pharmacists are being informed that generic bronchodilator metered dose inhalers should not be used with a large volume spacer since this could lead to decreased efficacy. We believe that clinicians and pharmacists should know that some metered dose inhalers may be more efficient than others in terms of depositing drugs in the lung airways and, therefore, that the same amount of drug will not necessarily enter the lungs when different metered dose inhalers are used with the same spacer system. In our opinion these differences are unlikely to be of significant clinical relevance with regard to bronchodilator treatment.

There are differences between the pulmonary depositions achieved by different inhalation devices, and this is particularly important with dry powder inhalers. There can be considerable differences between the pulmonary depositions achieved by different dry powder inhalers, metered dose inhalers, and a metered dose inhaler with a large volume spacer. It is, therefore, important for clinicians and pharmacists to be aware of this and that a change of steroid inhaler could lead to a clinically significant increase or decrease in pulmonary deposition and in clinical efficacy. Whenever an inhaled steroid device is changed close clinical monitoring is necessary so that treatment can be stepped up or down as appropriate. However, we do not believe this to be as important with inhalation devices containing bronchodilators.

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1 Advertisement. *Pharmaceutical Journal* 1994;252:between pages 876 and 877.
2 Advertisement. *Pharmaceutical Journal* 1994;253:between pages 8 and 9.

n of 1 trials

EDITOR,—I am not at all sure where you are trying to lead us. In the "editor's choice" in the issue of 22 October you say: "One sort of study that most doctors could undertake is an n of 1 trial in which treatments are allocated randomly and in double blind fashion to a single patient. . . . If you have a patient for whom you are not sure whether one drug will be better than another then maybe you have an ethical commitment to embark on such a trial."

I do not have any patients who take drugs and do not fall into the above category. The decisions that I make (salbutamol or ipratropium bromide? Azathioprine or cyclophosphamide? Bendrofluazide or co-amilofruse?) are invariably not made on a double blind basis but are based on some reasonable (to me) therapeutic hypothesis and partly on the results of trials that pertain to a relevant group of patients (but not necessarily to the patient in question); observations both clinical and investigative of the apparent effects in that particular patient; cost; and, not least, what the patient tells me of any apparent symptomatic effect, good or bad.

Suppose I select just one patient for an n of 1 trial out of the 12-16 whom I see in an outpatient clinic. Suppose all my colleagues do the same. We then go to the pharmacy and ask it to make up double blinded packs of the two drugs, as Lyn March and colleauges did for their comparison of paracetamol and diclofenac, which were "identically presented." This week I shall need nifedipine versus amlodipine, next week amoxycillin versus erythromycin. It is not, even remotely, practicable.

March and colleagues did not do a series of n of 1 trials with different pairs of drugs. They did a series of n of 1 trials in a defined group of patients with the same pair of drugs. In short, they did a standard double blind randomised trial in a group of patients in the standard way and then looked at individual repsonses within the group. Our pharmacy would respond on that basis, but what's new?

Could it be that editorially you have somewhat exaggerated the point?

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1 March L, Irwig L, Schwarz J, Simpson J, Chock C, Brooks P. n of 1 trials comparing a non-steroidal anti-inflammatory drug with paracetamol in osteoarthritis. *BMJ* 1994;309:1041-6. (22 October.)

Postnatal sexual health

EDITOR,—The author of the personal view who believed that she could not be the only woman to have felt "physically and mentally broken by the experience of childbirth and its aftermath"[1] strongly echoed findings from our survey of sex after childbirth underaken for the National Childbirth Trust earlier this year (G Barrett and C Victor, British Sociological Association's medical sociology conference, York, 1994). Altogether 1010 women replied to a questionnaire placed in the winter edition of the trust's magazine (circulation roughly 10 000). They gave details of their background, most recent delivery, and subsequent sex life. The characteristics of respondents broadly reflected the profile of the membership of the National Childbirth Trust (91% were married, 76% were aged 30 or over), and, as would be expected of members of the trust, a high proportion (97%) breast fed. Rates of intrapartum procedures (caesarean section (12%), forceps and ventouse delivery (14%), and episiotomy (28%)) were similar to rates found in the wider population.[3]