

I would cross swords with Mr Smith in regard to "tight heel cords" as a primary condition. It is, of course, a contraction of the muscles and there seems to be clear evidence that it is secondary to the foot deformity.¹ There is now no good reason why children with physiological flat feet should flood orthopaedic clinics and, even worse, have ineffectual treatment "to reassure the parents" when the pathological flat foot can now be confidently identified, the principle of treatment understood, and orthoses designed and continued for an adequate time, thus avoiding the considerable limitation of ambulation in the adult hypermobile foot.

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- 1 Smith MA. Flat feet in children. *BMJ* 1990;301:942-3. (27 October.)
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SIR,—Mr M A Smith states that "orthoses will not alter the natural correction" and that in feet that do not correct naturally, "treatment will make no difference either."¹

Though I would agree that a high proportion of feet correct with growth, I would like to draw attention to a retrospective study we carried out on 85 feet in skeletally mature subjects who had had uncomplicated flat feet to assess the effects of treatment.² The results suggested, but did not prove, that early mechanically effective treatment for feet judged to be abnormal will produce appreciable improvement whereas late or mechanically ineffective treatment may allow deterioration.

In view of these results our statistician thought that a randomised trial of treatment would not be ethically justified in patients with more severely affected, uncomplicated, flat feet. As a small group of patients develop symptoms later in life if the deformity persists we recommend that early effective orthotic treatment should be offered.

This leaves us with the dilemma of how to recognise this group at an early age. The great toe extension test³ goes some way towards achieving this, but further research is required to identify the group more accurately. Work continues in the orthotic research and locomotor assessment unit to this end.

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Retreat from medicine

SIR,—Dr A G Donald's experience of falling numbers of applicants for vocational training schemes¹ is certainly confirmed by what has happened in Yorkshire. In one district it was necessary to advertise three times before places on the vocational training scheme were filled.

Many districts are now appointing Dutch and German doctors to fill the posts, and in peripheral district general hospitals it is now common to find many doctors from other European countries. It would seem that the NHS is staffing its junior medical posts with such doctors in the same way as it used to fill them with doctors from India and Pakistan.

But where are our own graduates going? Many of them seem to be spending a large part of their

training in Australia and New Zealand, countries that have a law limiting the length of time a doctor can be on duty and where overtime is paid for at a higher rate. The big problem for the NHS is to try to discover whether these doctors will ever return to the United Kingdom in the present medicopolitical climate.

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- 1 Donald AG. Retreat from general practice. *BMJ* 1990;301:1060. (10 November.)

SIR,—Dr A G Donald's editorial suggests that the difficulties facing NHS doctors are growing.¹ With the current restriction on training grades it is unlikely that more doctors will be able to enter hospital medicine. Thus if general practice becomes unattractive more young doctors will seek careers outside medicine. Indeed, the *BMJ* has carried advertisements offering advice to those wishing to leave medicine.

We need to know how many medical graduates are seeking careers outside medicine and the reasons why they leave (as opposed to those who make known their complaints but remain). We cannot afford the expense or the time of skilled teachers to train doctors if they are to become disillusioned or disappointed by failure in their chosen careers.

Last year I tried to identify and contact London graduates of the previous two years who had failed to complete preregistration posts. Admittedly my inquiries had no official status, and medical schools pointed out that data on their students were confidential. It seems, however, that there is no system for keeping track of the careers of individuals.

The Department of Health does record numbers: between 1981 and 1987 an average of 4% of medical graduates did not start the preregistration year (this may include overseas graduates who returned home), and an average of 7.6% of those who started did not complete the year. (At each stage slightly more men than women left.) I do not know how many doctors leave practice prematurely.

Medical teaching and qualification is too precious a privilege to be wasted. At present no one is responsible for finding out how much is lost, why, and what is happening to these doctors.

I would like to suggest that some organisation should, with the cooperation of the medical schools, have a responsibility for prospectively monitoring this information and for making public their findings. This could be the General Medical Council, the Department of Health, or a university department of social studies.

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- 1 Donald AG. Retreat from general practice. *BMJ* 1990;301:1060. (10 November.)

Carbon monoxide poisoning in the home

SIR,—Mr Rudy Crawford and colleagues reported cases of carbon monoxide poisoning from a gas boiler.¹ We would like to draw attention to the risks from open fires.

A 61 year old man was referred with a suspected myocardial infarction and a four hour history of retrosternal oppression. He had been given diamorphine at home and had vomited in the ambulance. On admission to hospital he was drowsy with small pupils, and inspiratory crepitations were audible at the left base. Electrocardio-

graphy showed sinus rhythm with 2 mm of ST segment depression in the anterior leads. Chest radiography gave normal results. An initial neutrophil leucocytosis (white cell count $19 \times 10^9/l$) resolved, as did the electrocardiographic changes. His serial cardiac enzyme activity was normal, and he remained asymptomatic from the time of admission.

An interesting feature had, however, been noted in the initial history: on awakening with chest pain he had eventually alerted his wife, who, after rising to telephone, collapsed herself, although her condition was not thought serious enough to warrant hospital assessment. On talking to her later the possibility of carbon monoxide poisoning became apparent. The couple were temporarily without electricity and, as they were in the dark, had lit a fire upstairs, which they continued to burn overnight. It was smoky as they had a blocked chimney. The patient's carboxyhaemoglobin level on admission to hospital was 33%. His wife was tested three days later and then had a normal level (1.1%). Neither of them has been symptomatic since. An exercise test on the patient gave a normal result (modified Bruce stage 6).

Exertional syncope is a feature of acute carbon monoxide poisoning,² as is myocardial ischaemia. Ischaemia occurs at lower carboxyhaemoglobin concentrations in those with pre-existing coronary disease³ and is an indication for hyperbaric oxygen.⁴ Carbon monoxide is a hazard with incomplete combustion of any carbon containing fuel.² Natural fires are fashionable, and although faulty or poorly ventilated gas appliances remain the more common cause of accidental poisoning,² poorly ventilated domestic open grates should not be forgotten and chimneys should be swept at least once a year.³

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Recognising pseudo-seizures

SIR,—Dr M D O'Brien discussed the management of status epilepticus in the hospital.¹ We believe that junior doctors faced with such a medical emergency should be made more aware of a related and important clinical problem.

Pseudo-seizures have an incidence as high as 15% in epileptic patients whose attacks are poorly controlled.² In a review of a regional neurology centre true status epilepticus was found to be infrequent compared with pseudo-seizures.³ Pseudo-status epilepticus can lead to unnecessary repeated administration of parenteral anticonvulsants with potential risk to the patient. Respiratory arrest occurred in eight out of 69 episodes of pseudo-status epilepticus in 13 patients reported on by Howell *et al.*³

We identified four patients with pseudo-status epilepticus who presented over six months. All received multiple boluses of intravenous diazepam and various other parenteral anticonvulsants in the emergency department on the assumption that they were in status epilepticus. One patient required transfer to the high dependency unit following iatrogenic respiratory arrest. They were admitted to hospital on 21 separate occasions over the six months, one girl having been admitted to five hospitals in the region. This multiple hospital attendance has been found by others.⁴

Clinically pseudo-seizures may be mistaken for genuine fits as they are usually tonic-clonic in appearance, although occasionally manifesting as complex partial seizures. Certain features are helpful in differentiation, including gaze aversion, resistance to passive limb movement or eye opening, prevention of the hand falling on to the face, and induction by suggestion.³ Previously normal electroencephalograms, particularly during an attack, or normal serum prolactin concentrations during a pseudo-seizure can be useful in supporting the diagnosis.⁴

Status epilepticus is a medical emergency that requires prompt treatment with anticonvulsants. Patients with pseudo-status epilepticus, however, are more at risk from medical treatment than from their condition, and early recognition of pseudo-seizures would avoid iatrogenic complications. This might be facilitated by rapid access to a register of patients with pseudo-seizures. The register should be held in local accident and emergency departments in the region as these patients may attend many hospitals.

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Plastic bullets in Northern Ireland

SIR,—The article by Mr Robin Touquet and Dr Teresa Challoner is factually incorrect and requires comment.¹ Plastic bullets were first introduced in 1973 and replaced rubber bullets completely in 1975. In that time three people were killed by rubber bullets and 14 by plastic bullets, including seven children. The fatality rate is therefore one per 3857 bullets fired.

The bullet comes in two sizes. The most commonly used is the 25 grain Teflon bullet, which weighs 135 g. We would disagree that the plastic bullet quickly loses its speed and kinetic energy because it is small and fairly light. It is far heavier and more accurate than the rubber bullet it replaced and was designed for short range use in an effort to immobilise rather than kill. It is important that doctors commenting on this controversial subject should at least be factually correct, and a film criticised for being "unsophisticated" should not be met by an equally unsophisticated review.

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- Touquet R, Challoner T. Plastic bullets in Northern Ireland. *BMJ* 1990;301:1053. (3 November.)

AUTHOR'S REPLY,—Messrs Ritchie and Gibbons are correct about the plastic bullet's weight: we meant to say that the bullet is large and fairly light. But the other statistics that we used, including those on fatalities, came from the army, and clarifying any discrepancies is difficult because the Ministry of Defence is reluctant to discuss details.

We were told that there is one size of plastic bullet—3.7 cm by 10 cm, weighing 135 g. Rubber bullets were of a different size and had a different size of charge and thus a different muzzle velocity. They are no longer in use.

The Ministry of Defence has assured us that in Northern Ireland currently only the above size of plastic bullet is being used with one size of charge, giving a muzzle velocity of roughly 250 km/h.

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Trauma in pregnancy

SIR,—Dr Pamela Nash and Mr Peter Driscoll quite rightly stress the priority of resuscitating the pregnant woman, assessment of the fetus forming part of the secondary survey.¹ One aspect that they only touched on is the need for caesarean section after maternal death or when maternal death seems imminent.

There can surely be few tragedies greater than the delivery of a cerebrally damaged orphan secondary to maternal death and fetal anoxia. I would therefore be interested in their views on the cases in which women have major trauma during pregnancy and then have a cardiac arrest. It seems unlikely that external cardiac massage could maintain an adequate placental circulation for long, even in a normovolaemic patient. Prolonged unsuccessful attempts at resuscitation must clearly jeopardise fetal viability. At what stage and on what indication should caesarean section be undertaken if it is to result in the successful delivery of a healthy infant?

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AUTHORS' REPLY,—Before attempting a post-mortem caesarean section it is essential to attain signs of fetal viability and confirm that the estimated gestational age is greater than 26 to 28 weeks. Fetal prognosis is based on the time interval between maternal death and delivery, with delivery within five minutes being associated with best fetal outcome and caesarean section at greater than 20 minutes being unlikely to produce a live fetus.

Before a caesarean section is performed fetal viability must be ascertained and maternal cardiopulmonary resuscitation continued throughout. A vertical mid-line incision should be made through the abdominal layers into the uterus. The fetus is then removed from the uterine cavity and resuscitated by the paediatric team. The cord is clamped and the placenta removed.

There have been occasional reported cases in which the mother has revived after delivery of the fetus, so it is worth continuing cardiopulmonary resuscitation after delivery of the child to assess the mother for signs of life.

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SIR,—Dr Pamela Nash and Mr Peter Driscoll state that caesarean section is indicated when a pregnant woman has died after major trauma.¹

We would like to emphasise the current view that caesarean section should not be regarded as a last ditch effort to save the fetus but as an important part of the armamentarium in maternal cardiopulmonary resuscitation.² The mechanism for improved maternal survival probably includes complete resolution of aortic caval compression associated with emptying the uterus rather than partial relief brought about by using the lateral position.³

We are currently studying the resuscitation skills of obstetric and midwifery staff and have found that the misconception that caesarean section is performed only to increase fetal survival to be commonplace. We would therefore commend readers to refresh their knowledge of resuscitation of pregnant women by reference to recently published reviews of the subject such as that by Rees and Willis.²

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- Nash P, Driscoll P. Trauma in pregnancy. *BMJ* 1990;301:974-6. (27 October.)
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Readmission rates

SIR,—Certain points in the triad of papers by Dr Alan Clarke and colleagues¹⁻³ require further clarification.

In calculating rates of readmission the inclusion of planned readmissions and day cases in the numerator and the use of live discharges as a denominator (rather than total deaths and discharges) may lead to artificial differences between specialties and services—for example, those where patients are routinely admitted to die.

When audit of a sample of case notes of patients readmitted was undertaken as a means of determining avoidability of readmission, it should be remembered that this was in part an audit of the completeness of the documentation of those notes. In addition, a substantial proportion of notes were not obtainable, and one explanation might be that this group represented a subset of patients with chronic relapsing conditions whose case notes were required at day hospital or outpatient clinics, thus excluding a sizeable group with chronic or recurrent illness who would have been classified as unavoidable readmissions.

At this juncture it would seem that no single measure is a reliable or robust indicator of outcome. Any combination of indices used for this purpose will require some estimation of case mix to be included. Until complete readmission data are available and responsive to case mix and severity it will not be possible properly to assess their potential role as part of an outcome indicator profile for an individual unit, hospital, or district. It is difficult to perceive a useful outcome indicator that is not subject to the "perverse incentive," whether by admission or discharge controls as well as the confounding factors of variability in community and primary care services.

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- Chambers C, Clarke A. Measuring readmission rates. *BMJ* 1990;301:1134-6. (17 November.)
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Delayed detection of congenital hearing loss

SIR,—We agree with Dr N J Wild and colleagues that hearing impairment in infants should be diagnosed as early as possible.¹ We were interested that they found that no children were misdiagnosed as hearing impaired or unaffected by brain stem evoked audiometry. This technique assesses the