examination. Infants cannot describe their complaints and often resent abdominal palpation. Stringer and colleagues confirm that among children with intussusception only a minority have the traditional triad of symptoms.

It is natural for trainees in general practice to try to reach an accurate diagnosis, but in these difficult circumstances it is probably wiser to observe the rule that a patient who has evidence of continuing acute abdominal disease for more than six hours must be considered to have a surgical condition. If this is uppermost in the practitioner's mind he or she is less likely to delay in seeking a surgical opinion.

To improve the management of intussusception in hospital Stringer and colleagues advise "expedient treatment in a centre with combined paediatric radiological, anaesthetic, and surgical expertise." The first line of treatment in most cases, after correction of dehydration, is now generally agreed to be hydrostatic reduction under an image intensifier, with the surgeon ready to proceed if necessary. In most series about a fifth of patients who are operated on require a resection. This is a regimen that requires radiologists, anaesthetists, and surgeons with paediatric expertise. Some district hospitals can call on these skills, but the few infants admitted with an acute abdomen mean that other hospitals cannot easily acquire them. Attention has been drawn to these problems,⁶ and the British Association of Paediatric Surgeons has considered them, but Stringer and colleagues' report shows that some infants still receive less than expert care.

As more consultants are appointed and it becomes usual for each general surgeon to have a special interest we can reasonably expect that each district general hospital will have at least one surgeon with paediatric skill. Until then there is no dishonour in recognising that some sick infants require speedy transfer to the regional paediatric surgical unit.

PETER F JONES

Cults,
Aberdeen AB1 9HR

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SIR,—We think that in their attempt to produce practice guidelines from their audit of childhood deaths from intussusception Mark D Stringer and colleagues have overlooked a particular problem in the diagnosis and management of this condition in children, possibly because of the small sample they studied.¹

We and others have become increasingly aware of the difficulty of diagnosing intussusception in neonates and premature infants (M P Lewis *et al*, unpublished findings).² Although fairly unusual in this age group, intussusception causes considerable diagnostic problems when it occurs. Because of the similarity of the presentation of neonatal intussusception and the common condition of necrotising enterocolitis an ultraconservative non-operative policy may be adopted with disastrous consequences.^{3,4} Early consideration of the diagnosis and a low threshold for operation are to be recommended in view of the appreciable incidence of jejunal atresia in these infants, which is thought to result from the ischaemic necrosis during the intrauterine pathogenesis of the condition.³

Recommendations attempting to reduce serious

complications in children presenting with intussusception should not overlook the problems in neonates and premature infants.

MARK EMBERTON

Royal College of Surgeons of England,
London WC2A 3PN

M P SINGH

Department of Surgery,
Royal Postgraduate Medical School,
Hammersmith Hospital,
London W12 0NN

- 1 Stringer MD, Pledger G, Drake DP. Childhood deaths from intussusception in England and Wales, 1984-9. *BMJ* 1992;304:737-9. (21 March.)
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The fast of Ramadan

SIR,—Awad H Rashed's editorial on the fast of Ramadan is a reminder of the need to monitor the medical effects of this religious observance.¹ Unfortunately, his contention that breast feeding mothers are exempt from fasting is not universally accepted, and some authorities allow exemptions only for the sick or travellers, who should subsequently make up missed days.^{2,3}

Last week we admitted a 1 month old child whose mother had been successfully breast feeding. After the start of the fast her milk supply dried up and the child was given the local alternative of goats' milk diluted with heavily polluted canal water. The child became extremely ill with diarrhoea and vomiting and required intravenous rehydration. On medical advice the mother was allowed to break her fast with the proviso that the missed days should be made up afterwards. Her milk supply returned and the child was discharged well; obviously, though, if the mother fasts again the child may again be at risk.

During Ramadan some local Muslims allow people who have a good reason to avoid fasting to give morning and evening meals instead to a poor person who can fast in their place. Muslim doctors whose conscience will allow them to do so will be doing a great service to Muslim infants by encouraging the idea of a special dispensation for breast feeding mothers.

DEREK A MCHARDY
MORRIS EPHRAIM

Rural Health Care Project,
Kunri Christian Hospital,
Kunri 69160,
Tharparkar,
Sindh,
Pakistan

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Effect of overdose of trazodone

SIR,—We doubt G Balestrieri and colleagues' interpretation of hyponatraemia and seizure being due to an overdose of trazodone.¹

Firstly, no mention is made of the blood concentration of trazodone. The therapeutic concentration of the drug is 1.6 mg/l; 25.7 mg/l is associated with moderate toxicity. Serious symptoms of toxicity are well recognised with doses exceeding 750 mg and include dry mouth, dilated pupils, and urine retention. The authors also do not mention the sodium concentration on admission, and the

laboratory results quoted may well have been due to overhydration of the 72 year old patient.

Secondly, the sweating and anxiety that the patient experienced were probably due to the withdrawal of oxazepam and propranolol, which she had been taking for 10 years. The vasopressin concentration was not measured.

Trazodone is fairly safe in overdose compared with first generation tricyclic antidepressants. Animal studies suggest that it does not lower the seizure threshold and causes minimal cardiovascular disturbances.²

EMMA BAUGHAN

S S M JAWAD

Department of Psychological Medicine,
University of Wales College of Medicine,
Cardiff CF4 4XN

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AUTHOR'S REPLY,—We could not measure the blood concentration of trazodone, but the dose of trazodone (350 mg) may well be considered to be an overdose in a lean (35 kg) old woman. The serum sodium concentration (118 mmol/l) was measured immediately after the seizures and was the first measurement obtained. We do not think that the infusion prescribed (1000 ml of 5% glucose and 500 ml saline daily) could have caused overhydration in a patient without appreciable cardiac, renal, or hepatic impairment. On the contrary, the urine was hypertonic in relation to plasma, and this was consistent with inappropriate secretion of antidiuretic hormone. Measurement of vasopressin is not required to diagnose this syndrome.

The patient had taken oxazepam and propranolol irregularly for six months. We agree that some of the symptoms could be related to the withdrawal of these drugs. Seizures were observed in our patient during profound hyponatraemia; in our opinion seizures may more easily be correlated to ion imbalance than to a direct effect of trazodone. Seizures have, however, been described in patients receiving trazodone in therapeutic doses.¹

GIANPAOLO BALESTRIERI

Facoltà di Medicina e Chirurgia,
Università degli Studi di Brescia,
25124 Brescia,
Italy

- 1 Tasini M. Complex partial seizures in a patient receiving trazodone. *J Clin Psychiatry* 1986;47:318-9.

Advanced trauma life support courses

SIR,—As a successful candidate I can vouch for the effectiveness of the advanced trauma life support course as a method of learning for doctors caring for patients with trauma in hospital.¹ Unfortunately, the course, and Jerry P Nolan and colleagues' editorial, does not address the most important problem of trauma care in the United Kingdom.

The cost of trauma is unquestionable, whether it is measured in terms of fatal and non-fatal casualties, distress caused to patients and their relatives, distress suffered by the staff of the emergency services, or cost to the nation (assessed in 1989 at £6.36bn a year).²

A large proportion of deaths from trauma occur before the patients reach hospital,³ and early treatment improves mortality from accidents.⁴ In the United Kingdom there is still a substantial "therapeutic vacuum" between accident and hospital, which can be filled by immediate care doctors.⁵

A report by a working party of the Royal College

of Surgeons highlights the importance of an integrated response to trauma, care before patients reach hospital, and communication between doctors and the emergency services.⁶ Unfortunately, it does not mention immediate medical care, provided at the scene of accidents throughout the United Kingdom by over 2000 doctors trained by the British Association of Intermediate Care. Indeed, in their major review of deaths from trauma Anderson *et al* do not discriminate between victims who have received immediate care before reaching hospital and those who have not.³

All doctors should be trained in emergency medicine at undergraduate as well as postgraduate level.^{8,9} The pattern of trauma is different in the United Kingdom from that elsewhere, and accepting American training methods⁴ without modification may not be appropriate.

Advanced trauma life support has much to offer as a systematic approach to trauma care but is only partially successful in meeting the needs of immediate care doctors, with its focus on x ray investigation, diagnostic peritoneal lavage, urinary catheterisation, and rectal examination, all of which are inappropriate at the scene of an accident. I look forward to the development of an advanced trauma life support module for immediate care of trauma victims.

ANDREW J MOWAT

Heckington,
Lincolnshire NG34 9QP

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Establishment of pregnancy after removal of sperm antibodies in vitro

SIR,—Several of Rekha Sharma and colleagues' criticisms¹ of our paper on the establishment of pregnancy after the removal of sperm antibodies in vitro² are unsound.

Firstly, antibodies do not "bind irreversibly to sperm at ejaculation." The binding of any antibody to antigen is a reversible reaction dependent on non-covalent interactions; the antibody-antigen complex is in equilibrium with the free components, and the affinity constants for these interactions vary widely (from <10¹⁰/mol to >10¹²/mol) and depend on the particular antigen and antibody.

Secondly, there is evidence that although IgG attaches to the sperm in a time dependent manner after ejaculation,³ this is not true of IgA, which is already present on the sperm before ejaculation. The current view is that either IgA alone or a synergistic combination of IgA and IgG isotypes is principally responsible for the inhibition of fertility by antibodies to sperm.⁴

Thirdly, it is not true that "the technique is unsuitable for cases in which almost all sperm in the ejaculate are bound to antibodies." The rate of recovery of antibody free sperm from a sample containing antibodies is too high in many of our patients to be accounted for simply by selection of those sperm that were initially antibody free. We recently achieved a pregnancy by using sperm treated as described in our paper; the direct

immunobead test for the male partner had given initial results of 95% positive for both IgG and IgA.

Clearly there will be variation among patients in the antigenic sites expressed on the sperm, in the titres and types of antibodies concerned, and in their affinities. We find that the yield of antibody free sperm varies among cases. Nevertheless, we have now established six clinical pregnancies in 17 patients treated; in all of these cases there was a long history of immunological infertility.

If the logic expressed by Sharma and colleagues was correct no method that depended on competitive interference of the antigen-antibody interaction for its efficacy would be feasible—and that would apply to their procedures as well as ours.

CAROLYN E GRUNDY ALAN G GORDON
JOHN ROBINSON DOUGLAS M HAY
KATHARINE A GUTHRIE

Hull IVF Unit,
Princess Royal Hospital,
Hull HU8 9HE

1 Sharma R, Bromham DR, Sharma V. Establishment of pregnancy after removal of sperm antibodies in vitro. *BMJ* 1992;304:640. (7 March.)
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Data on vaccine uptake should be checked

SIR,—Joanne M White and colleagues report that districts that had changed their child health computer systems recently showed the greatest increase in vaccination coverage,¹ presumably because the change drew attention to the accuracy and completeness of reporting and the quality of data. In Sandwell, despite a change of computer system in 1989, reported coverage rates have remained low. General practitioners and health visitors have always been sceptical of the accuracy of the data on which these rates were based. Recently, I carried out an exercise that lends support to White and colleagues' suggestion that updating and validating data might further improve recorded coverage.

The rates of uptake of vaccination for Sandwell in the various birth cohorts defined by the COVER (cover of vaccination evaluated rapidly) scheme run by the Public Health Laboratory Service² were generated by running a routine inquiry on the child health computer. I also obtained from the database a list of children in each of the birth cohorts who were recorded as not having been immunised with the relevant antigen. The vaccination status of these children was verified by health visitors by reference to independent manual records. Children who were no longer resident in the district were also identified. The resulting changes in both the numerator (number of children immunised) and denominator (number of children in the cohort) for each antigen led to a revised coverage rate (table). The number of vaccinations performed had been considerably underreported

so that the revised coverage rate was 7% higher than the draft figure for diphtheria and pertussis in the 15-18 month age group. Only a small part of this rise was due to eliminating from the base population children who had moved away.

There may be many reasons for doctors failing to notify the computer about immunisations, but in Sandwell the most likely seems to be that general practitioners are paid by the family health services authority on the basis of claims submitted, without reference to the child health computer. Increasingly, general practitioners are tending to manage and schedule the immunisations of children on their lists. Without a financial incentive to do so they are likely to regard as unnecessary the chore of notifying the computer system. With a mobile, inner city deprived population such as Sandwell's, however, there is a strong case for central responsibility for achieving and maintaining high coverage throughout the district. Without accurate and reliable data, I do not think that this responsibility can be discharged satisfactorily.

JAMMI NAGARAY RAO

Sandwell Health Authority,
PO Box 1953,
Sandwell District General Hospital,
West Bromwich,
West Midlands B71 4NA

1 White JM, Gillam SJ, Begg NT, Farrington CP. Vaccine coverage: recent trends and future prospects. *BMJ* 1992;304:682-4. (14 March.)
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Modular contracts for general practitioners

SIR,—General practitioners' salaries are creeping up the agenda, but general practitioners' circumstances and skills vary enormously so that a universal contract may be unattainable. I propose individual contracts to utilise all of a general practitioner's skills, allow better provision of services, permit performance related pay and reaccréditation, end exploitation, and rekindle enthusiasm by providing achievable personal goals.

Individually defined "modular contracts" should be introduced for each principal, with modules comprising the job description, targets, pay scale, and defined accreditation. Variations for caseload, deprivation, hours, etc, would apply. Modules might include minor surgery, immunisations, out of hours cover, course organisation and teaching, hospital work, intrapartum care, audit, cover for colleagues, administration, counselling, dispensing, cervical smear testing, committee work, work for nursing homes, research, alternative therapies, and contraception.

General practitioners might select eight to 12 modules. Performance bonuses and rates of pay would reflect local priorities and mould work patterns. Local medical committees would shoulder the bargaining, guided by national recommendations. Partnership would be possible, but vulnerability to partners' vagaries, the closet sale of goodwill, and inequitable profit sharing would be extinguished. General practitioners could alter their commitments with six months'

Data on uptake of vaccination before and after children's vaccination status was verified

Cohort and antigen	Age (months)	Draft figures			Revised figures				
		No in cohort	No vaccinated	Rate (%)	Moved from district	Revised denominator	Errors in No not vaccinated	Revised No vaccinated	Revised rate
Third, diphtheria	21-24	1067	947	88.8	9	1058	56	1003	94.8
Third, pertussis	21-24	1067	899	84.3	9	1058	56	955	90.3
Third, diphtheria	15-18	1126	987	87.7	10	1116	72	1059	94.9
Third, pertussis	15-18	1126	952	84.5	10	1116	72	1024	91.8
Measles, mumps, and rubella	24-27	1094	938	85.7	21	1073	26	964	89.8