for medical recognition of nursing autonomy and expertise in this field."

In view of the medicolegal and other implications of this article, I wish to state that I and many other dermatologists consider that short term use of a Eusol dressing to clear adherent slough from an ulcer is perfectly reasonable. We object to the way in which Eusol has been effectively banned by nursing diktat without appropriate consultation and for no very good reason.

J L BURTON

Bristol Royal Infirmary,
Bristol BS8 3LD

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SIR,—Despite the many papers that have been against the continued use of Eusol opinion remains divided about Eusol's value as well as its toxicity. Farrow even commented that the issue may actually be "the surface manifestation of a deeper dispute between doctors and nurses about authority and autonomy."¹

David J Leaper points out that there have not been any reliable, randomised controlled trials that might resolve the issue.² Most of us have been brought up to believe that no treatment should be given unless it has been validated by randomised controlled trials, but in the case of Eusol I suspect that an ethics committee's approval would be almost impossible to obtain, particularly as nurses are represented on most committees.

I conducted a controlled experiment on myself. I applied full strength Eusol to a cotton wool ball to one forearm and saline to the contralateral arm. The cotton wool was taped down, non-occlusively, with Micropore tape. I did not abrade any skin surfaces. Within one hour I experienced discomfort and, later, pain on the Eusol side only. Twenty four hours later there was an area of erythema, which subsequently progressed to blistering and superficial ulceration (figure). No lesion appeared on the contralateral arm. The lesion on the Eusol side was still visible two weeks later, and some skin pigmentation persisted for a further two years.

My experiment leads me to believe that Eusol should not be applied to normal, let alone wounded, skin. It would therefore be difficult to persuade me to subject any of my patients to a randomised controlled trial. We succeeded in persuading our pharmacy department to stop dispensing Eusol, although a senior surgical colleague circumvented

the embargo by obtaining supplies from an adjoining district hospital.

M BEEVERS

Department of Medicine,
Dudley Road Hospital,
Birmingham B18 7QH

- 1 Farrow S. The place of Eusol in wound management. *Nursing Standard* 1991;5(22):25-7.
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Adrenaline in allergic emergencies

SIR,—In their paper on angio-oedema related to angiotensin converting enzyme inhibitors Thomas Hedner and colleagues suggest that with "symptoms . . . an immediate subcutaneous adrenaline administration is of vital importance and the patient should be observed and hospitalised."¹ This recommendation is repeated in the relevant paragraph on the "This week in the *BMJ*" page, which states that "admission and prompt subcutaneous adrenaline administration are vital."²

Current recommendations suggest that adrenaline should be given intramuscularly rather than subcutaneously, as in allergic emergencies absorption from the site of the subcutaneous injection may be too slow, especially if the patient is shocked due to severe anaphylaxis.^{2,3} After intramuscular injection absorption is rapid and usually adequate if reasonable circulation is present.

As soon as any allergic reaction is recognised, first line treatment should include managing the airway, restoring blood pressure by laying the patient flat, and giving 0.5-1.0 mg adrenaline intramuscularly.^{2,3} Intravenous adrenaline is rarely warranted in allergic emergencies and, indeed, may be hazardous.⁴ If required it should be given slowly and in high dilution.⁴ Second line treatment should include an antihistamine—for example, intravenous chlorpheniramine 10-20 mg—which should be given immediately after intramuscular adrenaline.³ Intravenous corticosteroids have little place in immediate management as the beneficial effects are delayed.³

GREGORY Y H LIP
MALCOLM J METCALFE

Department of Cardiology,
Stobhill General Hospital,
Glasgow G21 3UW

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AUTHORS' REPLY,—Gregory Y H Lip and Malcolm J Metcalfe state that current recommendations suggest that adrenaline should be given intramuscularly rather than subcutaneously, referring to the *British National Formulary*.¹ In Sweden, though, the recommendation is to give adrenaline (1 mg/ml) 0.5-0.8 ml subcutaneously as soon as possible in cases of suspected anaphylactic reactions, urticaria, or angio-oedema.^{2,3} The subcutaneous administration of adrenaline was also considered to be preferable in a recent review on anaphylaxis in the *New England Journal of Medicine*.⁴

In severe cases when cutaneous circulation is impaired, other ways of giving adrenaline must be considered. The current recommendation in Sweden is to give diluted adrenaline (0.1 mg/ml) slowly intravenously in cases of anaphylactic shock. Circulatory shock was not seen in any of the

Swedish cases of angio-oedema in association with angiotensin converting enzyme inhibitors that we reported.

Regardless of the route of administration, we agree that adrenaline is the preferred drug for treating angio-oedema affecting the mouth, pharynx, or larynx.

THOMAS HEDNER
OLA SAMUELSSON
HELENE LUNDE

Departments of Clinical Pharmacology and Nephrology,
Sahlgrenska University Hospital,
Göteborg,
Sweden

- 1 BMA and Royal Pharmaceutical Society of Great Britain. *British national formulary No 22*. London: BMA and Pharmaceutical Press, 1991.
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Steroid ulcers

SIR,—M Guslandi and A Tittobello¹ accept the conclusion of Piper *et al* that patients taking a combination of corticosteroids and non-steroidal anti-inflammatory drugs double their chances of developing peptic ulcer.² This is an erroneous conclusion from that study. Piper *et al* reported that patients admitted to hospital with a peptic ulcer were more than twice as likely to be taking this combination of drugs than controls, an interesting observation that does not, however, prove that these drugs lead to the development of peptic ulcers. Alternative explanations are that this combination of drugs increases the risk of complications of peptic ulcer and that ulcer healing is delayed by this combination of drugs.

The distinctions are more than academic as a full understanding of mechanisms should aid the development of strategies for preventing drug associated complications of peptic ulcer disease. We provided direct evidence that non-steroidal anti-inflammatory drugs retard the healing of ulcers.³ In experimental studies with cryoulcers in rats the ulcers were larger, healed slower, and showed less reparative proliferative activity in the healing edge when non-steroidal drugs were given. When peptic ulcers from patients taking non-steroidal drugs were compared histologically with those from patients not taking such drugs the mitotic index of gastric crypts, a marker of the rate of regenerative repair, was considerably reduced at the ulcer edge in the patients taking the drugs.

We have studied the size and rate of repair of experimental gastric ulcers in rats receiving prednisolone and compared these with the effects of indomethacin or control vehicle (table). We have also investigated the effect of misoprostol, an analogue of prostaglandin E₁, on the healing rate of cryoinduced ulcers during administration of corticosteroid. Our results show that prednisolone, like indomethacin, results in larger gastric ulcers after cryoinjury than occur in the absence of these

Effect of various drugs on size of experimental gastric ulcers in rats (eight animals per group)

Drug treatment	Mean (SE) ulcer size (mm ²)	
	After 3 days	After 6 days
Control	3.1 (0.4)	1.6 (0.3)
Indomethacin 2 mg/kg	4.8 (0.3)*	3.1 (0.2)*
Prednisolone 10 mg/kg	5.7 (1.0)*	3.4 (0.3)*
Misoprostol 300 µg/kg	2.2 (0.3)	1.6 (0.2)
Prednisolone + misoprostol	2.5 (0.8)	2.0 (0.0)

*p<0.05 compared with control.

Arm 24 hours after application of Eusol

drugs. A prostaglandin E₁ analogue reverses the deleterious effect of giving corticosteroid, as we previously showed for indomethacin.

Piper *et al* concluded that their study might have missed an effect of corticosteroids alone on peptic ulcer disease as less than 8% of the patients they studied were taking doses of over 30 mg/day. Though we do not yet have data from humans, particularly on the rate of regenerative repair of peptic ulcers during treatment with corticosteroid, we do not believe that a clinically relevant effect of these drugs on human peptic ulcer disease in the absence of concomitant non-steroidal anti-inflammatory treatment has yet been ruled out. On this, as on the potential protective effects of prostaglandins and acid reducing agents, insufficient data are available.

M CARPANI DE KASKI S LEVI
R RENTSCH H J F HODGSON

Department of Medicine,
Royal Postgraduate Medical School,
London W12 0NN

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Octreotide and urinary glycosaminoglycan in Graves' disease

SIR,—We reported that octreotide is effective in Graves' ophthalmopathy and pretibial myxoedema.¹ P Perros and colleagues suggest that it will be more convincing if a reduction in circulating insulin-like growth factor-1 concentrations could be shown.² Although insulin-like growth factor-1 has been postulated to be related to the pathogenesis of Graves' ophthalmopathy,³ its concentration in serum was not raised in untreated patients (unpublished data). An increased accumulation of glycosaminoglycan in retrobulbar tissue from patients with Graves' ophthalmopathy and in the dermis of patients with pretibial myxoedema has been reported.⁴ Urinary excretion of glycosaminoglycan is increased in these patients and decreased after treatment with prednisolone.⁵ We find that octreotide also decreases urinary excretion of glycosaminoglycan in these patients.

We treated six patients with Graves' ophthalmopathy and pretibial myxoedema with octreotide 50 µg thrice daily for two days followed by 100 µg thrice daily. A 24 hour urine collection was made before and after treatment with octreotide for one week. Urinary glycosaminoglycan excretion was determined by the method of Kahaly *et al*⁶ except that the supernatant reacted with cetylpyridinium chloride and the isolated glycosaminoglycan was centrifuged for 30 minutes at 15 000 g. Urinary creatinine excretion was measured with an automatic multichannel blood chemistry analyser (Hitachi 736, Japan). Excretion of glycosaminoglycan was expressed as µg/mg creatinine. To avoid interassay variation, samples from each patient obtained before and after treatment were determined within the same assay. We also measured urinary excretion of glycosaminoglycan in three other patients with Graves' ophthalmopathy and pretibial myxoedema, 15 patients with Graves' ophthalmopathy, and 14 normal subjects; they all served as controls.

Urinary excretion of glycosaminoglycan was higher in the patients with Graves' ophthalmopathy, with and without pretibial myxoedema, than in the normal controls ($p<0.005$ and $p<0.05$, respectively). In the patients with Graves' oph-

Urinary excretion of glycosaminoglycan before and after one week's treatment with octreotide in patients with Graves' ophthalmopathy and pretibial myxoedema

Case No	Urinary glycosaminoglycan (µg/mg creatinine)	
	Before treatment	After treatment
1	11.3	10.2
2	7.0	5.4
3	32.8	12.1
4	11.8	7.5
5	20.5	13.7
6	60.1	45.2
Median (range)	16.2 (7.0-60.1)	11.2 (5.4-45.2)*
Median (range) in controls:		
Normal subjects (n=14)	6.8 (1.8-12.7)	
Graves' ophthalmopathy (n=15)	9.9 (4.4-26.0)†	
Graves' ophthalmopathy with pretibial myxoedema (n=9)	13.4 (7.0-60.1)‡§	

* $p<0.05$ Compared with value before treatment (Wilcoxon's signed rank test).
† $p<0.05$, ‡ $p<0.005$ Compared with normal subjects; § $p<0.05$ compared with Graves' ophthalmopathy (Mann-Whitney U test).

thalmopathy with pretibial myxoedema, urinary excretion of glycosaminoglycan significantly decreased after a week's treatment with octreotide ($p<0.05$; table).

Lymphocytes may produce lymphokines that stimulate production of glycosaminoglycan,⁶ and octreotide can inhibit responsiveness of T lymphocytes.⁷ Octreotide may therefore directly inhibit the release of lymphokines, resulting in inhibition of the production of glycosaminoglycan and a decrease in urinary excretion of glycosaminoglycan.

We thank Sandoz Pharmaceuticals for supplying the octreotide, Dr R Teoh for his encouragement and help, and Dr K S Tsai, Miss J C Lin, and Miss Sandy J H Huey for technical help. This study was supported by a grant from the National Science Council, Republic of China (NSC-80-0412-B002-176).

T C CHANG
W C YAO
C C CHANG

Departments of Internal Medicine and Dermatology,
National Taiwan University Hospital,
Taipei,
Taiwan,
Republic of China

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Reversing vasectomy

SIR,—I was disappointed that Anjan K Banerjee and Alan Simpson did not mention in their editorial the best pregnancy rates that have been achieved after reversal of vasectomy in the United Kingdom.¹ Jenkins and Blacklock reported a pregnancy rate of 64.5%.² They used a simple technique that required a prolene stent, which ensures that the lumina are accurately apposed; four sutures; and, perhaps most importantly, milking the epididymis of all obvious secretion before anastomosis so as to decrease the risk of

leakage of sperm and subsequent granuloma. This potential complication is arguably the most important for the long term results of this operation.

Banerjee and Simpson's comments questioning the desirability of performing this kind of surgery in a hard pressed NHS are valid. I suggest that adoption of Jenkins and Blacklock's technique would save operating time and obviate the need for expensive microsurgical equipment to be used, especially as there is no evidence that pregnancy rates are improved by increasing the complexity of the procedure.

D N TULLOCH

Department of Urology,
St Bartholomew's Hospital,
London EC1A 7BE

1 Banerjee AK, Simpson A. Reversing vasectomy. *BMJ* 1992;304:1130. (2 May.)
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Advanced trauma life support

SIR,—In his letter on advanced trauma life support Andrew J Mowat describes the focus of this method of managing trauma as being x ray investigation, diagnostic peritoneal lavage, urinary catheterisation, and rectal examination.¹ As a successful candidate on an advanced trauma life support course he will realise that x ray investigation, diagnostic peritoneal lavage, and rectal examination are part of the secondary survey.² Urinary catheterisation is part of the resuscitation phase. Although resuscitation can be started at the scene, urinary catheterisation is clearly not essential to the patient's survival before admission to hospital.

I came away from an advanced trauma life support course with the focus of the system ringing in my ears—namely, "A, B, C, . . ." This is the primary survey:

- A: Airway maintenance with control of the cervical spine;
- B: Breathing and ventilation;
- C: Circulation with control of haemorrhage;
- D: Disability: neurological status.²

Resuscitation begins while the elements of the primary survey are reassessed. Once the patient's condition is stable, and only then, the secondary survey begins.

Advanced trauma life support is one method of trauma care. If one method was adopted by all doctors caring for patients with trauma, life would be easier for us and perhaps safer for our patients. I would have thought that any immediate care doctor treating a patient at the scene of an accident could follow the "ABCD" above and begin appropriate resuscitation as taught by the advanced trauma life support course. I would certainly be happy to take on the care of such patients in an accident and emergency department and would be grateful to the doctor concerned.

R D A DODDS

Heatherwood Hospital,
Ascot,
Berkshire SL5 8AA

1 Mowat AJ. Advanced trauma life support courses. *BMJ* 1992;304:1114-5. (25 April.)
2 American College of Surgeons. *Advanced trauma life support course manual*. Chicago: American College of Surgeons, 1989.

SIR,—Andrew J Mowat comments on the need for better immediate care in the United Kingdom.¹ Deaths before admission to hospital are usually due to brain injury, haemorrhage, and airway problems. In addition, 15-35% of patients in whom a head injury is diagnosed before admission have secondary brain injury from hypoxia or hypovolaemia.²