LETTERS TO THE EDITOR

Intramuscular or intravenous adrenaline in acute, severe anaphylaxis?

EDITOR,—The consensus guidelines on the emergency medical treatment of anaphylactic reactions by the Project Team of the Resuscitation Council (UK) are an excellent guide for first medical responders, whether general practitioners or emergency department staff.1 They are pragmatic, safe, and emphasise the importance of first line treatment with oxygen, adrenaline (epinephrine) and fluids, and as Hughes and Fitzharris in their BMJ editorial suggest, rightly deserve to “...adorn the walls of emergency departments, general practitioners’ surgeries, and outpatient clinics...” The guidelines usefully remind us that a panic attack or a vasovagal syncopal episode may be confused with anaphylaxis with the danger of inappropriate treatment. Additional differentiating features not mentioned in the text that suggest a faint rather than anaphylactic collapse are the rapidity of onset, maintenance of a central pulse, and prompt response to the recumbent position.1

It is refreshing to see the debate over the delivery of adrenaline move forward a stage, with the subcutaneous route no longer recommended as the absorption is delayed and variable, at least in well children with a history of systemic anaphylaxis, when compared with the intramuscular route.2 The guidelines thus quite correctly favour the early administration of intramuscular adrenaline at a dose of 0.5 ml of 1:1000 for adults, to all patients with clinical signs of shock, airway swelling, or definite breathing difficulty. Intramuscular adrenaline given early, or when venous access is difficult and if the patient is unmonitored, is safe and effective even in less experienced hands.

We are grateful to Dr Brown for his kind general remarks about our consensus guidelines, we believe that they are currently the best available guidelines and we believe that they are indeed of benefit to all.

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Medical treatment of anaphylaxis

EDITOR,—We have read with grave concern the project team’s recommendations for the medical treatment of anaphylaxis3 and believe very strongly that the advice against using intravenous adrenaline (epinephrine) is potentially very dangerous. We also find the omission of reference to guidelines for the management of anaphylaxis in the accident and emergency (A&E) department particularly regrettable in the same journal1 as very regrettable if deliberate, or puzzling if the project team had no knowledge of their existence.

The project team’s guidelines have also failed to emphasise the relevance of grading the severity of anaphylaxis and that its treatment should be directed to the severity of the attack encountered.

We agree that the project team’s guidelines should be used by the inexperienced and invariably pre-hospital responders. We also agree that the subcutaneous route is unreliable and should be abandoned. However, to suggest that A&E seniors are unsupervising trainees and well supported juniors lack clinical credibility to administer high dilution intravenous epinephrine carefully titrated against response in the fully monitored patient in the resuscitation room is insulting to the specialty of A&E. It also shows that in spite of having A&E representation the project team fails to understand fundamental principles of A&E involvement in the management of the critically ill.

To suggest that patients with clinical signs of shock should be administered intramuscular epinephrine as epinephrine can be rapidly absorbed is in physiological terms most bizarre advice.

We conclude that the project team’s guidelines need urgent revision as they will lead to patients dying due to failure to urgently administer intravenous epinephrine. We will continue, as we hope the majority of A&E departments will do similarly, to use the published A&E guidelines1 and we believe that they are currently the best available guidelines for treating anaphylaxis in the A&E department.

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Professor Chamberlain replies on behalf of the Anaphylaxis Project Team

We are grateful to Dr Brown for his kind general remarks about our consensus guidelines, and also for giving us the opportunity to clarify one sentence in our introduction. We said “There has been a vogue for inappropriate use of intravenous epinephrine (adrenaline), both by paramedics in accident and emergency departments, when epinephrine...”
(adrenaline) should have been given intramuscularly
correctly. We believe this to be true, but it was
most certainly not our intention to condemn
all use of intravenous adrenaline by experi-
enced medical practitioners either in emer-
gency departments or elsewhere. In retrospect
we should have been more explicit in our
statement on this point. We agree totally with Dr
Brown's statement that adverse outcomes for
adrenaline occur when it has been given too
rapidly, inadequately diluted, or in excessive
dosage. We also recognise that emergency
medicine has progressed a long way in the last
decade with a much higher level of senior
supervision and greater possibilities for treat-
ment under monitored conditions.
Some guidelines were intended specifically
for those first medical responders who are
inexperienced in the management of this
emergency. They are unlikely to have monitor-
facilities available. For these, cautious rec-
ommendations are appropriate with intra-
venous use of adrenaline restricted to
emergencies judged to be immediately life
threatening.
The examples that we gave for indications
for intravenous adrenaline were clearly not
intended to be comprehensive, and experi-
cenced physicians in monitored areas will
appropriately make their own decisions. We
did mention the value of infusions of 1 : 10 000
adrenaline—a dose which permits titration of
dose against need. It may also be worth
emphasising that in asphyxia from upper
daerodynamic and hypoxia from severe bron-
chospasm, there are additional priorities—not
related parental adrenaline—such as oxy-
genation and nebulised inhaled bronchodil-
ators. Dr Brown's comments do, of course, add
to our own guidelines by making sound
recommendations for expert management
that was outside the remit of our article.
The concerns of Mr Gavalas and his
colleagues were similar, but there seems also
to be an element of misreading of our
document. They say that they “believe very
strongly that the advice against using intra-
venous adrenaline (epinephrine) is potentially
very dangerous”. We must reiterate that we
did not advise against its use, but urged only
that it should be used in the most serious cases
and by experienced clinicians.
Our guidelines stated in paragraph 4.4 that:
“Intravenous epinephrine (adrenaline) in a
dilution of at least 1:10 000... is hazardous and
therefore reserved for patients with
pronounced shock that is immediately life
threatening and for special indications”.
We also added in paragraph 5.2:
“The use of epinephrine (adrenaline) by
the intravenous route in the special circumstances
given in paragraph 4.4 should usually be
reserved for medically qualified personnel
who have experience of it, who know that it
must be administered with extreme care, and
who are aware of the hazards associated with
its use”.
The footnote to the legends state very
clearly: “Consider slow intravenous (IV) ephe-
phrine (adrenaline) 1:10 000 solution. This is
hazardous and is recommended only for
an experienced practitioner who can also obtain
IV access without delay”.
There are some practitioners who have
made the habit of always using adrenaline
intravenously, while others have preferred the
subcutaneous route, and many are afraid to
give it at all. We believe that we have given the
correct advice—that intramuscular adrena-
line is the norm for the emergency treatment
by first medical responders, with IV adrena-
line reserved for special and life threatening
situations. This is far from advising against its
use!
There is one charge to which we must plead
guilty. Of course we were aware of the
previous paper published in the Journal of
Accident & Emergency Medicine in 1998, and it
was indeed our intention to reference it
Radway with the other specialist recommen-
dations. That omission was not deliberate, and
many of us (DAC) must take responsibility for
that important last minute oversight.
We do not accept that the guidelines need
urgent revision. Neither does the Project
Team with its wide representation accept that
the recommendations as they stand are insult-
ing to the specialty of accident and emergency.
We are conscious that we all have the same
aims: better and safer treatment of an
important medical emergency.

Future infantile management of patients
with minor head injuries

Editor,—We read, with interest, the letter
from Pau and Buxton, regarding the need for
neurosurgical referral of patients with an
admitting diagnosis of minor head injury.1 We
agree that these are patients who have a low
risk group. We performed an audit of patients
admitted to our observation ward with the
primary diagnosis of minor head injury. From
October 1997 to July 1999, 686 such patients
were admitted under our care. Of these patients,
only two were subsequently transferred to the
regional neurosurgical unit after the finding of
intracranial haematoema on computed tomo-
graphy. This finding, and our general experi-
ence, leads us to believe that patients with an
admitting diagnosis of minor head injury do
not require neurosurgical referral, in the first
instance. However, we suspect, given that only
12% of responding accident and emergency
(A&E) departments (71% response rate) in
the UK have on-site neurosurgical facilities,2
this practice is not widespread anyway.
Pau and Buxton's conclusion is in keeping
with the recent report from the Royal College
of Surgeons.3 One of the logistical
concerns raised by this report, and highlighted
in Pau and Buxton's letter, is the fact that
observation wards have a finite capacity. Our
current practice is to admit all patients with an
admitting ward is full, these patients are admitted
under the general surgeons.4 The Way Ahead
document recommends that A&E observation
wards should be within, or immediately
adjacent to, the A&E department.5 We feel
that it is inevitable, when the only specialty
admitting patients with isolated minor head
injuries is A&E, that problems will arise when
the observation ward is full. It goes against the
spirit of the report of the working party to then
admit these patients under other specialties,
just because the observation ward is full. If
these patients are to be admitted to wherever
there are beds within the hospital, but still
under the care of A&E, we fear a major step
backwards in the standards of our practice if,
when a seriously ill or injured patient arrives
in the A&E department at 5 am, the only A&E
doctor on duty is at the far end of the hospital,
assessing a head injured patient.
The recommendations of the report have
provoked widespread debate and polarity of
views within the specialty. It probably repre-
sents a watershed in the management of A&E
departments that do not currently accept

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1 Pau H, Buxton N. Management of minor head
injuries by non-specialists. J Accid Emerg Med
2 Royal College of Surgeons. Report of the working
party on the management of patients with head
injuries. London: Royal College of Surgeons,
1999.
3 British Association for Accident and Emergency
Medicine. The Way Ahead: British Association
for Accident and Emergency Medi-

Cycle helmets

Editor,—I read with horror the British Medi-
cial Association's Board of Education and Sci-
ence conclusion that legislation to make
helmets compulsory for cyclists would reduce
the number of cycle helmets and not be in the inter-
est of health.6

As an accident and emergency consultant
for over 20 years, I have seen far too many
head injuries in cyclists, some fatal. The
major factor in causing most accidents is human
error. I agree, as the article suggests, that
cycling proficiency should be taught in all
schools and the driving test modified for
awareness of cyclists to other road users.
The government, as suggested, should subsidise
cycle helmets and promote them through the
media by advertising. The car driver is not
interested, but we need better cycle routes
nationwide.

Our government is committed to reduce
injuries from accidents (see Our Healthier
Nation). The main cause of death in children
is trauma. But I have personally discussed at
length the benefits of wearing a helmet with
children who, unhelmets, have suffered a
fractured skull in a cycle accident. Many chil-
dren still remain unconvinced! Parental con-
trol is weak. So voluntary action to increase
the wearing of cycle helmets in this age group
is unlikely to succeed.

My answer is that the compulsory wearing
of cycle helmets is needed now. This should be
introduced as part of a bigger cycle safety
programme—teaching, better routes, helmet
subsidies, and increased awareness through
publicity. The number of cyclists may well
reduce initially but more importantly head
injuries will become fewer too! However, in the
future, the population of cyclists naturally
will then increase as cycling at last becomes
safer and so even more enjoyable.

There has been successful government
legislation concerning road traffic accident
prevention and injury protection—for exam-
ple, the breathalyser laws, compulsory crash
helmets for motorcyclists, and the seat belt
laws. These are still supported by publicity.
The legislation could be extended.

We as an emergency specialty, however,
have a responsibility in accident prevention
and injury protection. We all need to be active,
as I have been, in the local press recently
highlighting, for example, the need for cyclists
to wear helmets. We recognise this problem only
too well.

Our department has a nurse who travels
locally, but would welcome other views
ways of managing the patient.

1 Pau H, Buxton N. Management of minor head
injuries by non-specialists. J Accid Emerg Med
2 Royal College of Surgeons. Report of the working
party on the management of patients with head
injuries. London: Royal College of Surgeons,
1999.
3 British Association for Accident and Emergency
Medicine. The Way Ahead: British Association
for Accident and Emergency Medi-

Letters
Playing in the back seat

Editor—We read with interest the letter of responsibility of prevention and be active. Pre-

game. Have you put a bid in? We have.

Editorial not local. Government money is avail-
little use of a seat belt and would like to present another aspect of seat belt misuse. 1 A
pair of 7 year old identical twins presented to the accident and emergency (A&E) depart-
ment after being involved in a head-on road traffic accident. Both had been restrained in four point child seats in the back of the car.

In the department, one was complaining of abdominal pain, the other none. On examina-
tion of the twins, both were haemodynamically stable. Twin 1 had bruising to her abdo-
men, the other none. This bruising was linear in nature across her abdomen, “the seat belt sign”. She had no focal tenderness.

In view of the seat belt sign, twin 1 was admitted and an abdominal ultrasound was performed at this stage. The ultrasound showed a small amount of fluid in the pouch of Douglas, but no other free fluid or lesions of visceral organs.

Overnight she remained painful, but haemodynamically normal. A further ultra-

sound was performed the next day which showed free fluid within her abdomen.

It was performed that confirmed turbid fluid and this was converted to a laparotomy. Three lesions were found in her jejunum, one full thickness and two partial. A 15 cm resection of her jejunum was performed with anastomosis. She made an uneventful recovery.

On detailed questioning while in the A&E department, she stated that she had been playing a game with her twin sister and had wriggled out of her shoulder straps. This had converted her four point child seat into a lap belt. Twin 2 had remained properly restrained in her child seat.

Lap belt use has been recognised as a mechanism of blunt injury to the small bowel. The seat belt sign is associated with an increased likelihood of intestinal injury. 2 This lap belt injury in children usually occurs when children are large for their safety seats and too small for adult seat belts. 3

This case highlights the importance of the seat belt sign, but more importantly that chil-
dren within their own safety seats need to be restrained properly within them. Incorrect usage results in injury similar to adult lap belts.

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1 Carnall DC: Cycle helmets should not be compuls-


Editor—Drs Onyeka and Booth present an interesting case of tension pneumothorax associated with Boehrhaave’s syndrome. 1 I have previously described and written in 1994 a 47 year old man who survived his ordeal in 1996. 2 As the authors note, awareness of the condition is the mainstay of diagnosis.

Aside from these two cases, tension pneumothorax has been described in associ-
ation with rupture of a Barrett’s oesophagus 3 and after rupture of an oesophageal diverticulum. 4 It is worth noting that by far the commonest cause of oesophageal rupture is after endoscopy. Regardless of the cause of rupture I agree with the authors that a gastro-

grafting oesophagram is the diagnostic proce-
dure of choice.

Conservative management of oesophageal rupture is now a well established option in iatrogenic and has been described in Boehrhaave’s syndrome, 5 although as the authors note, immediate surgery comprising drainage and repair is the mainstay of curative treatment.

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6 Troum S, Lane CE, Dalton ML. Surviving Boehrhaave’s: this trial also included severely poisoned patients and incorporated shames treatments. This study found 191 patients that three days of HBO (2.8 atmospheres for 60 minutes) offered no advantages compared with three days of NBO (100 minutes 100%). Another study is continuing in the United States and the interim results have found no difference in the incidence of persistent neurological sequelae between those treated with HBO compared with NBO, although there is an increased incidence of delayed sequelae in one of the blinded treatment arms.

The authors also recommend careful neurological and cognitive re-examination. It is worth highlighting that cognitive testing in carbon monoxide poisoning is far from stand-

dardised. Many studies utilise different screen-
ing tests, different time intervals to re-
screening, and different HBO regimens. This lack of standardisation makes it difficult to compare studies and no doubt contributes to our inability to provide definitive recommen-
dations in the management of carbon monoxide poisoning.

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1 Turner M, Hamilton-Parrell MR, Clark RJ. Car-

2 Scheinkestel CD, Bailey M, Myles PS, et al. Hyperbaric or normobaric oxygen for acute car-
bon monoxide poisoning: a randomised con-


3 Weaver KL, Hopkins RO. C1O2 for CO1: a Double blind, controlled, prospective, ran-
donised clinical trial in patients with acute car-

The authors reply

We also read with interest the paper by Scheinkestel et al, which was published after acceptance of our article. 1 Scheinkestel’s paper was accompanied by a detailed editorial which documented a number of criticisms that preclude implementation of its findings until further data are forthcoming. 2 Recommenda-
tions from poison information centres, as described in our article, have not been changed and still provide useful guidance on selecting patients for hyperbaric oxygen.

We believe that careful neurological exam-
ination, including specific testing of cognitive function, is vital in the management of patients. Physicians should use tests with which they are familiar and apply them serially to the same patient. Standardisation of formal cognitive testing for trials was beyond the scope of our clinically orientated article.


Evidence based and guideline based medicine

Editor—Evidence based and guideline based medicine is justifiably emphasised in current accident and emergency (A&E) medical practice. At St James’s University Hospital in Leeds, the A&E trainees participate in regular evidence based critical appraisal sessions as part of education development, and such skills are assessed in our Faculty of Accident and Emergency Medicine exit examination.

One source of valued literature is Sackett et al, particularly their appraisal cards on the validity, importance, and applicability of a particular type of study. Lacking a photo-
graphic memory, I put forward simple acronyms that have helped me to facilitate timely and efficient appraisal for everyday use when selectively scanning relevant journals. Preceding these specific acronyms is a “stand-
ards" acronym that follows Crombie’s suggestion that standard questions should be used as a filter for all papers.1

I hope they are of use to fellow practitioners of evidence based medicine, and further suggestions will be gratefully received.

### Standards
- Stated aims?
- Tests and measures appropriate?
- Arithmetic (do the numbers add up?)
- Design appropriate?
- Relevant to your practice?
- Different results from previous reports?
- Sample size/power adequate?

### Diagnosis
- Diagnostic test needed?
- Independent blind comparison?
- Appropriate population?
- Gold standard used regardless of test result?
- Numerogram (2×2 table) constructable?
- Sensitivity and specificity important?
- Inferences possible?
- Safe, cheap, and helpful?

### Prognosis
- Prospective study?
- Representative sample?
- Objective and blinded outcome criteria?
- Groups adjusted for prognostic factors?
- Numbers recruited and followed up adequate?
- Outcomes likely?

### Study findings precise?
- Inferences possible?
- Similar patients to your own?

### Guidelines
- Guidelines needed?
- User friendly?
- Identified risks and benefits?
- Decision options clear?
- Evidence based decisions?
- Large variations in current practice?
- Implementable?
- NHS benefit?
- Economical?
- Safe?

### Therapy
- Trial ethically approved?
- High recruitment and follow up?
- Equal treatment and assessment in each group?
- Randomised and how?
- Appropriate population?
- Potential benefits for patients?
- End points applicable?
- Absolute risk reduction/number needed to treat?

### Systematic review
- Systematic search strategy?
- Randomised and relevant trials?
- Each trial assessed?
- Valid results in all trials?
- Inconsistent populations or results?
- Evidence of benefit via odds ratios/number needed to treat?
- Was hypothesis satisfied by the review results?

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**Weekly web review**

Editor,—A noteworthy web site exists for emergency department evidence based medicine enthusiasts. The Weekly Web Review in Emergency Medicine (www.wwrem.com/) is dedicated to the critical analysis of current clinical literature on topics relevant to the practice of emergency medicine. It has a useful rating system for each of the articles reviewed and an archive database. It dovetails with this journal’s journal scan and has useful links, notably with the Centre for Evidence Based Medicine at Oxford. I recommend it as a useful adjunct to any emergency physician’s continual professional development.

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