with trauma is improved, the London helicopter emergency medical service may be a relatively equitable and efficient means of providing high quality care for such patients in Greater London. The issue of the effectiveness of the helicopter compared with other modes of transport has not been adequately assessed.

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Design of study predisposed to type II error

EDITOR,—In their paper on the London helicopter emergency medical service J P Nicholls and colleagues, of the University of Sheffield's medical care research unit, mention several concerns[1] that we expressed at the time that the unit published its first report on the service to the Department of Health in 1994.[2]

The helicopter is part of an integrated specialist trauma service, and it is unfortunate that the unit looked at parts of the service separately. In doing so the unit isolated the effect of the helicopter from the effect of the hospital. We believe that patients require a continuum of care, such that separation of these effects is misleading. The study group contained only a third of all the patients treated by the London helicopter emergency medical service and transferred to the base hospital, and the unit's original report admitted that "Plainly these numbers are too small to establish whether there is any benefit associated with the [Royal London Hospital] in terms of survival."[2] This is borne out by the wide confidence intervals in Nicholls and colleagues' paper. It would be expected that any benefit from the entire system would be best seen in those patients taken to hospitals with a full range of trauma facilities when the nearest hospital does not have appropriate facilities for definitive care. To reduce the size of this group by ignoring two thirds of the patients brought to the Royal London Hospital predisposes to a type II error.

Other important factors include the fact that the study period included the greater part of our learning curve; the evident mismatching in terms of anatomical severity of injury and physiological response of the patients attended by the London helicopter emergency medical service and those attended by the London ambulance service; and the delay in publication, which means that the data are two years out of data. Even when these factors are allowed for, the paper points to benefits of the system, which are clearly stated in the abstract. The service is considerably busier now than it was at the time that the data were collected and is more accurately targeted. We are therefore encouraged that the study shows that 13 patients a year are alive who would have died if treated by the conventional system. This figure is now almost certainly higher. The fact that the confidence intervals include zero merely reflects the low power of the study.

We are also encouraged that in its original report the medical care research unit found that the helicopter emergency medical service "usually triages patients appropriately," although this comment is not in Nicholl and colleagues' paper. This finding agrees with our analysis of our triage decisions.[3] These results support the continuation of this important initiative to redress the poor outcome of trauma care in Britain.[4]

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Helicopters do not care for patients

EDITOR,—J P Nicholl and colleagues' paper shows some of the misconceptions that develop when an expensive piece of machinery such as a helicopter is associated with medical care.[1] A helicopter is a machine that flies through the air and can be used to transport personnel and equipment. It does not deliver medical care: the personnel and equipment do. The misconception that the helicopter delivers care pervades the literature on this subject, and this paper is no exception. To state that "we have assessed the effectiveness of the London helicopter" is wrong. The sole purpose of the helicopter personnel and equipment is to provide rapid resuscitation in the field.[2] What the authors should have assessed is the effectiveness of rapid resuscitation in major trauma. The difference between the treatment groups was the difference in personnel and equipment provided to achieve resuscitation.

Unfortunately, the paper does not define resuscitation and therefore fails to establish the number of patients requiring resuscitation. No criteria are given for "achieving resuscitation," so the number of patients who were resuscitated was not measured. Presumably some patients in the helicopter group did not need resuscitating since they were taken to hospital by ambulance and were not accompanied by a member of the helicopter personnel. Hence one would not expect a difference in outcome between this group and the ambulance group, but the design of the study meant that such patients were regarded as being in the helicopter group.

Since 26·9% of patients in the helicopter group had a triage revised trauma score of ≤ 9, compared with 16·6% in the ambulance group, probably more patients in the helicopter group required resuscitation because their trauma was more severe. Consequently, the two cohorts were not comparable in terms of patients who were severely injured, as the authors acknowledge. The number of patients who were resuscitated and recovered to have an acceptable quality of life was not measured. Quality of life is a crucial issue but was not addressed by this study.

My conclusions are that the design of the study was flawed and that the crucial outcome measurements were not made. The paper raises more questions than it answers and is certainly not a comprehensive assessment of the London helicopter emergency medical service.

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Miscalculation exaggerated benefits

EDITOR,—J P Nicholl and colleagues estimate that an extra 13 patients with major trauma (injury severity score ≥ 16) could survive each year if attended by the helicopter emergency medical service in Greater London.[1] This seems to be based on an arithmetical error. For patients with an injury severity score of 16-24 the relative risk of death associated with being attended by the helicopter versus an ambulance is reported as 0·8 but should be 1·1 on the basis of the figures in table IV. This in turn represents a relative risk of death of 1·2 for all patients with a score of ≥ 16 and 1·1 for patients with a score of 16-40.

The suggestion that extra lives could be saved is not supported by the data presented. With only one preventable death being averted by the presence of a doctor in 337 attendances by the helicopter and a higher relative risk of death for both minor and major trauma, there is no justification for sending up medical crew on helicopter missions in Greater London.

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Dramatic management of trauma may be counter productive

EDITOR,—J P Nicholl and colleagues report that analysis of trauma and injury severity scores showed that 16% more deaths than predicted occurred in patients with trauma attended by helicopter but only 2% more in patients attended by land ambulances crewed by paramedics.[1] On average the helicopter patients arrived in hospital 10-20 minutes later than the ambulance patients. They were managed more intensively at the scene and spent an average of six minutes longer there.

The authors suggest that the comparatively longer time spent at the scene of the incident by helicopter patients may lead to poorer outcomes in some patients. This supports the theory that "scoop and run" is preferable to "stay and play." Is the helicopter patients' more intensive management directly related to the drama engendered by the arrival of the helicopter? Is such drama counter productive?

Over the past decade the management of major trauma in Britain has become increasingly dramatic, with the introduction of paramedics, thoracotomy in the field, helicopters, trauma centres, etc. Despite this, convincing evidence of the advantages of such dramatic approaches is lacking. Yet to question such "progress" has been regarded as Luddite. For example, Purkiss *et al* found that none of 18 patients with trauma survived resuscitative thoracotomy.[2]

The dramatic approach to trauma does not necessarily equate with improved survival: there may even be an inverse relation between the two. Those interested in the management of major trauma await the overdue conclusions resulting from the Department of Health's survey that compared results in a trauma centre with results in more conventional accident and emergency departments. Could it be that the establishment of a trauma centre does not result in the expected improvement in survival?

I suggest that helicopters and thoracotomy in the field are examples of the emperor's new clothes. The key to the successful management of trauma lies in improved education, training, and super-