

## ATLS and beyond

The aftershocks of the crash of a light aircraft in Nebraska are still reverberating around the surgical world. The pathos and anger provoked by the image of an injured surgeon struggling to protect his family from the failings of the health care system of the richest country in the world caused others to ask 'could it happen here?' (ATLS, 1990).

The Royal College of Surgeons asked that question in 1988 and the answer was yes. It not only could happen but did happen. Up to a third of injured patients were dying in circumstances where the earlier involvement of a more experienced and specialized doctor might have led to a more favourable outcome (Anderson *et al.*, 1988). The exposure of the critically ill and injured to the most inexperienced members of the team is built into the British hospital system. The wheel is continually re-invented every 6 months. It's not the fact that the casualty officer who asked me for advice on the 31st of July is now the voice on the phone when I request specialist advice on the 1st of August that concerns me so much as the fact that he suddenly feels able to give me that advice.

The problem is compounded further by the relatively infrequent exposure of certain specialties to severely injured patients. In a recent study of all the injured patients admitted to a large hospital centre in a year (Maryosh *et al.*, 1992), general surgeons were involved with 131 (5.2%) of the 2506 injured patients admitted to the hospital. Of the 1469 surgical operations performed on injured patients general surgeons performed 26; orthopaedic surgeons, meanwhile, performed 1212. Ten of these general surgical operations were on severely injured patients but this was still only 11.2% of the surgery performed on the severely injured. When this annual experience is divided between all those on-call throughout the year the individual's exposure to the severely injured patient may be very small indeed. This was the experience of one of the largest and busiest hospital centres in the U.K. The exposure of the general surgeon in an average district general hospital in the U.K. to severe injury may be very small indeed.

The Advanced Trauma Life Support (ATLS) programme of the American College of Surgeons was developed to give clear and unequivocal guidelines to the inexperienced. It has never attempted to be the definitive treatise on trauma care and has an in-built conservatism to weather the storms of fashionable treatments. Furthermore it was designed by and for North American doctors. Nevertheless, even in translation the message is clear and of relevance to the U.K. The Royal College of Surgeons of England, in my view, was extremely wise when they established the course in the U.K. Those unwilling to accept the flaws in the present system could have adapted the system to British practice so that it would merely have perpetuated the status quo. By operating the American course as it were, under licence, British doctors have been exposed to a form of teaching previously alien to them and have accepted, more than ever, the need for common protocols to oil the wheels of a team's effort. However, a by-product of this has been a creeping fundamentalism on the part of some with regards to treatment regimes and the potential to overlook what is good in our own system and the circumstances in which the majority of us work.

The first page of the American ATLS manual (1990) opens with the statement 'trauma is a surgical disease'. In the U.K., however, only 55.9% of all the injured and 64.5% of severely injured patients in a year required an operation (Maryosh *et al.*, 1992). A&E doctors were involved with 100% of the injured patients and anaesthetists with all the severely injured patients. The combination of these two specialties, working in tandem to receive the injured patient, is a powerful combination and may supersede the group call-out of the trauma team. The presence of an experienced anaesthetist when the patient arrives allows immediate and sophisticated control of the airway and the early institution of controlled ventilation. This has been thought to be a crucial step on the road to increasing the number of unexpected survivors (Spence *et al.*, 1988). The ATLS course assumes only a basic level of skill in controlling the airway and sedation and paralysing agents are not mentioned at all. The intubation of injured patients without anaesthesia and analgesia is a feature of some North American centres but should not be a feature of British practice. Anaesthesia is now the largest hospital specialty in the U.K. and can provide immediate support to most A&E departments. Anaesthesia and analgesia for the injured patient must be incorporated into future developments of the British ATLS programme.

The greatest achievement for ATLS in the U.K. may prove to be the shift it has caused in the approach to fluid administration. British clinical practice has been always to err on the side of caution for fear of overloading the injured patient and is reiterated in recent texts (Westaby & Kobayashi, 1989). Whilst fluid overload is a serious complication it is far less of a problem than fluid depletion. Traditional teaching held that blood loss was not significant until heart rate increased and blood pressure fell. The fact blood pressure does not fall significantly until 30–40% of circulating volume has been lost did nothing to stir surgeons from their time honoured stand. ATLS appears to have changed this approach and more surgeons appear willing to administer fluid before the fall in blood pressure heralds the onset of profound circulatory collapse. Nevertheless, the price that has been paid for this conversion is the incorporation of the North American adherence to crystalloid into British practice. Without reopening the now sterile debate on colloid versus crystalloid, the facts are that both have advantages and disadvantages but may very usefully be used together (Boon, 1986). Three to four times the amount of fluid lost must be given as crystalloid which may have adverse effects on the lung (Rackow *et al.*, 1983). The movement of crystalloid into the extravascular space, however, does ensure that not only the intravascular compartment is filled. This mutual dependence of colloid on crystalloid has been stressed by others with emphasis on the early administration of colloid to re-establish adequate tissue perfusion to be followed by crystalloid to fill the extravascular space (Messmer, 1986). Furthermore the North American allergic reaction to colloid is largely a response to albumin. This is not used in the U.K. for resuscitation except, perhaps, for major burns. The absence of North American reference to the fluid gelatins owes more to the FDA than clinical experience. It is not available in the U.S.A. and therefore does not feature in ATLS. It has been available in the U.K. for several years and forms part of the standard equipment of British A&E departments. It has also been used successfully in action by the military (Williams *et al.*, 1983). The lesson of ATLS is to give large amounts of fluid early. Debates about the

nature of that fluid are of far less importance than understanding this simple but vital maxim.

Diagnostic peritoneal lavage was incorporated into ATLS, like so much else, to assist doctors in small American hospitals to recognize those patients with occult abdominal haemorrhage and so arrange their early transfer to a better equipped and staffed facility. There is no doubt that general surgeons in the U.K. are often sceptical of the technique, preferring to trust in other less invasive methods. Once again ATLS has been instrumental in promoting a healthy scepticism of the value of some time honoured physical signs and encouraged surgeons to replace 'wait and see' with 'look and see'. Much of the debate about DPL may become irrelevant however as the role of the radiologist in the early management of the injured patient is increased (Gould *et al.*, 1988).

Preparing the inexperienced for the unexpected has no doubt improved trauma care. The Royal College of Surgeons went further however and joined the North Americans in their appeal to concentrate severely injured patients in specialized centres. Large numbers of injured patients would be expected by the centre and treated by experienced doctors. The Department of Health responded to this demand by funding a trial trauma centre. The North Staffordshire Trauma centre opened on the 1st of July 1991. There has been no new buildings to divert money from direct patient care and the £2.5 million pounds has been invested in personnel. The centre forms the nucleus of a trauma system through which patients pass from the periphery into the specialized facilities of the trauma centre. There is a consultant within the department 24-h a day, which in itself marks a major break with traditional British practice. Furthermore, the consultant is drawn from a pool of four A&E physicians and two anaesthetists. The combination of these two specialties, as expected is proving particularly effective. The initial results within the centre are very promising. The wider system is also being scrutinized to investigate and establish the limits within which patient flow can be manipulated.

The ATLS movement has had a profound effect already on the approach of British doctors to the injured patient. Its benefits can only increase as it develops and its graduates are increasingly able to practice their skills in a system that always matches the severity of injury to the seniority of the response.

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