Advanced trauma life support

ATLS: past, present, and future
P Driscoll, J Wardrobe

ATLS is at a crossroads in its development

The family tragedy in 1976 gave birth to the trauma legend known as ATLS. In that year a plane piloted by the orthopaedic surgeon J Styner crashed in Nebraska. His wife was killed and four children seriously injured. Unfortunately for Dr Styner he found that the subsequent care received in the local hospital was inferior to what he was able to provide for 10 hours at the scene of the accident. In the ensuing inquiry the need to train clinicians in trauma care became evident.¹

Using the educational structure of the recently developed ACLS programme, the first ATLS course was run in Nebraska in 1978. The following year it was taken up by the American College of Surgeons Committee on Trauma (ACS COT) and rapidly spread throughout the North, Central, and South America. Today ATLS is taught in over 42 countries and around half a million clinicians have completed the course (J Hughes, personal communication). In the UK alone over 13 000 providers and 3000 instructors have been trained since its arrival in 1988 (S Dilgert, personnel communication).

As Nolan says in his article, ATLS originally represented a state of the art training course on the care of major trauma.² Its new and refreshing educational format made it accessible to all clinicians dealing with trauma in the resuscitation room. The reason for this was that it incorporated clear clinical principles that underpin the course. These have not changed in 28 years:

- Trauma is a surgical disease
- Treat the greatest threat first
- Lack of history should not prevent assessment starting
- Lack of a precise diagnosis should not prevent treatment starting
- The course teaches one safe system

These principles became translated into the now famous structured approach to trauma care. With even medical students being familiar with this system, it is easy to forget how revolutionary these thoughts were in 1976. Older readers will empathise with McKeown’s comments regarding the state of trauma care in the UK in 1988 when ATLS first arrived.³

Integral to the success of the ATLS course was the educational principles on which it was based. Out went the formal lecture; in came the intimate, almost personal tuition. The 2.5 day course is intense but supportive allowing candidates to learn from instructors in a variety of ways.⁴ The pace of the course builds up, crescendo-like, to the point when the candidates carry out their own simulated resuscitation. All other life support courses, and indeed significant parts of undergraduate and postgraduate training, have subsequently copied these educational points.

The final element in the success of ATLS is its quality control system. From its inception it aimed to provide a system of care that was safe, effective, and able to be practised in all trauma receiving hospitals. Through the offices of the ACS COT the manual and course were reviewed every four years. They also only issued providers and instructors with certification valid for the same length of time—again to encourage clinicians to remain up to date. With strict use of copyright and control of dissemination, the character of the course has been maintained over 26 years, six editions, and transfer to 42 countries. ATLS remains an internationally recognised standard of care and is an icon for all other life support courses and educational formats.

With such glowing praise it may seem churlish to criticise it. There are however some significant problems that require serious consideration. From its origin it is easy to understand the ACS COT view of “Trauma being a surgical disease”. As a consequence ATLS can only be exported to a surgically approved centre (such as the Royal College of Surgeons) and a surgeon must direct all courses. Unfortunately these rules do not reflect reality. The TARN databases since 1990 show that 65.4% of the cases required surgery of which 24.5% needed it within eight hours (M Woodford, personnel communication). Most of these cases were orthopaedic procedures. As Nolan states the trauma patients are managed by a team of people representing a range of specialties—most notably emergency medicine, anaesthesia, and orthopaedics. This heterogeneity is reflected in the course participants—32.7% come from anaesthesia, 24.6% from emergency medicine, and 16.8% from orthopaedics (S Dilgert, personnel communication). It is therefore interesting to note that up to the latest edition there were no emergency medicine or anaesthetists acknowledged as contributors to the course manual.

Nolan and McKeown list further inconsistencies between the course and how trauma care is practised in the UK and other countries. Important areas of controversy, such as airway management, may simply reflect US practice and the lack of non-surgical input into the course preparation. Davis also reviews the educational principles underpinning ATLS and how UK instructors have interpreted these differently.⁴ The interactive approach with a community of practice ensured by the instructors being there for the whole course are not typical of US run ATLS courses.

As ATLS courses are not cheap to set up, run, or attend, their cost effectiveness has been questioned. Of all the life support courses, ATLS has probably been subjected to the most appraisals. They are known to increase knowledge and skills (at least temporarily), confidence, and lead to a change in practice.¹ In contrast it has never been shown that the courses increase patient survival or reduces disability. As ATLS addresses only one aspect of a spectrum of care this is not surprising.

All these issues would be tolerable if it were not for the perceived rigidity in the ATLS organisation. The time delay in bringing about changes and the problems in trying to incorporate non-US practice has led to discontent even within ATLS supportive groups. The latest edition being launched this month in the UK three years late only increases this disquiet. In view of these problems, the desire for evidence based medicine, and the financial restrictions on postgraduate education, it is understandable that people are asking would it be better to run our own trauma course.

ATLS development is at an important crossroad in the UK and, possibly, in the world in general. There are three main options. Firstly, no changes could be made to the organisation. The current problems could be put down to a passing phase and the previous good track record used to show that there is no need to change a winning formula. The risk with this option is that people do not think the “formula is winning”. As a result the decline in enthusiasm for the course would continue and limit further spread in the UK and to other countries.
The next option is to develop a completely new course with an entirely UK (or European) group of instructors and educationalists with its own production, distribution, and quality control administration. Such an answer would have the advantages of relevance and cost control. There would be the problems of increase in variation with other countries, lack of international recognition, and problems of maintenance. In addition it needs to be appreciated that while details of treatment might change, it is unlikely that the basic system used for ATLS could be improved; the phrase, “re-inventing the wheel” comes to mind.

Before accepting this option the driving force behind the individuals and groups wishing to see a separate UK or European course also need to be considered. Many protagonists honestly believe the disadvantages of staying in the ATLS family outweigh its advantages. A minority are motivated by more transient emotions such as feeling excluded, xenophobia, and possibly even jealousy. It is important to know what is driving people because the costs and time commitment required to develop this type of course are huge, even for the UK. If one considers a European based course then the problems increase further. Nevertheless it is possible and there are structures and personnel who can do it. The question is, are advocates for this option motivated enough to keep it going over 26 years and six editions?

The final option, as described by McKeown, is to increase the involvement of international groups. In so doing issues such as core content (for all) and peripheral (for local needs) could be addressed along with the thorny issue of cost versus resources. This solution is likely to generate enthusiasm, and passion because of its local relevance while being part of an international family. However, these advantages would need to be balanced against reduced central control, finances, increased variation, reduced quality control, and an increase in organisational complexity.

In summary, from its tragic origin ATLS has become an icon in medical education. However, its quality control system and administration has led to rigidity and a perceived lack of interest in non-US ways of managing trauma. There is no doubt that ATLS is at a crossroads in its development. To do nothing runs the risk of a schism developing. Alternatively it could adapt to become a truly international course. Either option will require trauma enthusiasts wishing to develop a more effective course for patients rather than a reaction to a current set of problems.

**EDITORIALS**

**Advance trauma life support**

**Advanced trauma life support in the United Kingdom: time to move on**

**J P Nolan**

There are strong reasons for the UK to develop its own advanced trauma life support course.

When the Advanced Trauma Life Support (ATLS) was introduced into the United Kingdom in 1988 it revolutionised trauma training for doctors who were expected to treat seriously injured patients. The American College of Surgeons’ Committee on Trauma (ACS COT) had compiled a course manual that, in the main, represented state of the art practice in the treatment of major trauma. The style of teaching was refreshing; indeed, much of medical education in the UK has evolved into the same scenario based interactive format. I had the opportunity to take the course in Baltimore, Maryland in 1989. In the following year, as an attending anesthetist at the Shock Trauma Center in Baltimore, I was then able to see the teaching applied while resuscitating seriously injured patients covering the range of blunt and penetrating trauma. I gained my ATLS instructor status while in Baltimore and taught on two provider courses there before returning to the UK. When I started teaching on ATLS courses in the UK in 1991, I was immediately impressed by the highly interactive format and strict adherence to core content; both of these features were different from my experience on courses in United States.

Although ATLS is considered an international course, and is run in at least 23 countries (http://www.facs.org/meetings_events/atls/region15.html), the course content is controlled entirely by the ACS. Like many of the early ATLS instructors in the UK, I was led to believe that our constructive comments would be fed back to the ACS COT and that this feedback would be taken into consideration when revising the course core content. I now know that we were being rather naive and, despite the best efforts by several UK ATLS committee chairmen, our suggestions, along with those from many other countries, have been largely ignored. I don’t blame our American colleagues for being reluctant to implement suggestions from other countries: they will want to ensure that their own course is tailored perfectly to the requirements of doctors working in the American healthcare system. Globally, cultures and healthcare systems vary considerably and it is unrealistic to expect a single course to suit everyone. A parallel can be drawn with attempts to develop standardised international cardiopulmonary resuscitation (CPR) guidelines: despite reaching international “consensus” there remain significant differences between the CPR guidelines published by the American Heart Association (AHA) and those of

**REFERENCES**

The ATLS concept has continued to evolve; the course format has failed to keep pace with developments in education. Other life support courses have moved almost completely away from lectures to workshops; where lectures remain, they are delivered using high quality PowerPoint slides. These changes can be controlled and implemented entirely by the relevant national course committees.

- The revised manual should have been published in 2001; the current edition was published in 1997. A compendium of proposed changes appeared two years ago and yet the ACS COT has only just announced the expected publication date for the 7th edition (October 2004).

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- Even with the compendium of proposed changes, some of the ATLS core content is falling behind state of the art trauma practice; for example, low volume fluid resuscitation.

- The ATLS Committee has persistently flagged up problems with the way that airway management is taught and yet little has been changed—this total lack of input by specialists other than “trauma surgeons” is a reflection of American practice—it bears no relation to practice in virtually any other country in the world.

- The ATLS concept has continued to focus on the single handed physician working in a small rural hospital (in the United States). Although this may have been applicable to some parts of UK practice 15 years ago, it is certainly not now: in most UK hospitals receiving patients with serious injuries, resuscitation is undertaken by multidisciplinary teams. The ALS course assumes that cardiac resuscitation is undertaken as a team and training in team leadership is a fundamental part of the course; trauma resuscitation should be taught in the same way.

The fact that the course is controlled totally by the ACS COT prevents the Royal College of Surgeons of England from taking it forward in the way, I am sure, it would like to. It must be very frustrating to see courses such as Advanced Paediatric Life Support (APLS) and Advanced Life Support (ALS) evolve rapidly and embrace audiovisual technology and current educational practice.\(^1\)\(^2\)

The efficacy and cost effectiveness of life support courses is under close scrutiny. The high instructor to candidate ratios demanded by these courses creates a significant impact on limited NHS resources. In the case of ATLS, this is compounded by the significant profit made by the ACS from the sale of course manuals. The current cost of an ATLS manual to a course centre in the UK is £68 and this will increase to £80 once the new manual is released. Based on my experience with the Resuscitation Council (UK) ALS course manual, the cost of printing a similar manual in the UK would be a fraction of this figure.

Surely, the time has come for the UK to develop its own generic trauma course. There are already plans to develop an European trauma course in association with the ERC. In theory, the concept of a European trauma course is sensible but I envisage at least two significant problems: firstly, international collaboration will slow the process of development and implementation of change; secondly, most other European countries have far more pre-hospital involvement by doctors than we have in the UK and a European trauma course is likely to have a strong pre-hospital bias. Initially, the development of a UK based trauma course may be the most efficient way of getting a course that suits the requirements of doctors in this country. The transition from ATLS to the UK equivalent will be problematic, but this is a long term investment and it will provide us with the ability to have total control of trauma education in our own country: control of the course content will enable integration with undergraduate curriculums in the UK. Those of us who have been ATLS instructors for many years have witnessed a dramatic change in the enthusiasm and motivation among students taking the course. This is probably partly because most are now compelled to take the course; in the early 1990s most of the candidates were genuinely keen to learn about major trauma. The recent drop in enthusiasm may also reflect the fact that many of the candidates have been taught much of the ATLS content before they attend the course.

Finally, we must consider some of the political sensitivities and conflicts that will have an impact on any decision to move away from ATLS. The ATLS course generates significant revenue for the Royal College of Surgeons of England as well as for the ACS. A future UK trauma course might not be under the administrative control of the RCS: it might, more appropriately, be administered by an intercollegiate body and this will mean redistribution of revenue away from the RCS. At the insistence of the ACS COT, in all countries the ATLS programme must be under the administrative control of a national surgical organisation. This does not reflect the multidisciplinary nature of the course: in the UK, 33% of ATLS instructors are anaesthetists, 25% are emergency physicians, 17% are orthopaedic surgeons, and only 11% are general surgeons.

In summary, although the ATLS course has been invaluable, I think that there are several strong reasons for the UK to develop its own trauma life support course. The national course committee would have the freedom to produce a course to suit the way trauma care is delivered in the NHS and the resources currently going to our American colleagues could be invested in our own training programme.

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Advanced trauma life support

Should there be a UK based advanced trauma course?

M Davis

An educator’s perspective

There is a good educational case for a UK advanced trauma course. The theoretical basis for the educational component of the ATLS instructor course is rarely made explicit and in my experience, never discussed, either among the educationalists or the clinical faculty. In UK practice there is an implied theoretical perspective within the ATLS course that is not subscribed to. In this article I aim to explore this theoretical basis and contrast it with what actually happens in instructor and provider courses in the UK. In doing so the educational justification for a UK based advanced trauma course will be discussed.

THEORETICAL FOUNDATIONS OF ATLS

Despite nods in the direction of “adult education” and “reflective practice”, much of the thinking behind section III chapter 2 of the ATLS instructor course manual is based on the behaviourist/instructional design educational theories of Gagné. This, however, is not made explicit other than in this definition of learning:

“Learning is a relatively permanent change in behaviour that comes about as a result of a planned experience in which learning results from the interaction between what students already know, the new information they encounter and what they do as they learn” (page 807)

The perspective is supported by Gagné’s view that “learning is something that takes place inside a person’s head—in the brain”.4

DIFFERENCE FROM US PRACTICE

In contrast with Gagne’s view, the UK based ATLS course shows:

- Attention to the needs of individuals and the groups to which they are allocated;
- The development of a sense of a critical and self critical orientation towards performance;
- Modelling of appropriate behaviour by members of the clinical faculty;
- Opportunities to engage in practice;
- Opportunities to engage in formal and informal discussion with fellow course members and faculty.

All of the above contribute to the development of a “community of practice”.

This is based almost exclusively on my personal experience, supplemented by anecdotal evidence from clinical colleagues. It is further enhanced by attempts to theorise about the nature of the underpinnings of the ALSG generic instructor course.6

This seems to be in noticeable contrast with the provision in the US where issues of collaboration and community are subsumed to availability of faculty and the capacity for the course content to speak for itself. In this latter respect, particularly, the course becomes the manual and the manual, the course. This somewhat robotic approach is not untypical of US higher and continuing education and while it seems efficient in terms of delivering some key content messages, it does little to embed them in practice and performance.

EMERGING THEORETICAL DESIGN OF UK PRACTICE

I have been an educator with ATLS since 1997 and for a little longer with ALSG, which shares a substantial cadre of clinical trainers. What is apparent is that while there is a degree of variation of provision, depending on the medical director, the clinical faculty, and the educator, there is a strong sense of what it means to be an ATLS provider or instructor. The work of Lave and Wenger seems to underpin much of the practice that has emerged from the interactions of senior faculty groups gaining familiarity with the US model and, I would argue, subverting some of its intentions and “domesticating” it. Accordingly, I am drawn to the conclusion that a UK version of an advanced trauma course would be best described by Lave and Wenger’s “situated cognition” and its focus on the “community of learning”.7

MERIT IN CLARIFICATION OF UK DESIGN

Practice over 15 years has determined to a large extent the nature of UK ATLS provision. In the event of the UK Steering Group deciding to launch its own course, there will be the opportunity to articulate practice: to make explicit the tacit practices that have grown up. This will have a number of clear benefits:

- to guarantee continuity of provision both in terms of style and content
- to set a standard that will be maintained despite the differences among faculty
- to acknowledge responsibility for change in provision in the light of changes in the environment.

STEPS TO DESIGN AND IMPLEMENTATION

Clearly, any attempt to create a new course, substantially based on existing UK practices and perceptions of best clinical performance, will have quite a long time scale. This, however, can be turned to advantage, allowing for, among other things, a systematic needs analysis (drawing from current activity in the Faculty of Accident and Emergency Medicine (manuscript in preparation) and a thorough exploration of stakeholder expectations. Inevitably issues of design will include an evaluation of the potential of new technologies to either supplement or replace current provision. For example, the European Resuscitation Council in collaboration with Giunti Laboratories has developed a virtual course that may lay the foundations for some aspects of this provision.

CONCLUSIONS

If only for the reasons of transparency and greater congruence between theory (where it is articulated) and practice, there is a good educational case for a UK advanced trauma course. Anecdotal evidence hints that US courses live out Gagné’s assertion that “learning is something that takes place inside a person’s head—in the brain”, whereas the practice that has grown up in the UK is that learning is a collaborative venture firmly located in the social.

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Advanced trauma life support

Should the UK develop and run its own advanced trauma course?

D McKeown

The strong ATLS infrastructure can provide a basis for the production of a truly international trauma course

I first heard of ATLS when I was a very junior consultant in anaesthesia and ICU. I had attended a meeting at which a (quite famous) intensivist had said that all major trauma patients should be anaesthetised, paralysed, intubated, have bilateral chest drains inserted, and undergo diagnostic peritoneal lavage. He claimed that this (in my view, dangerous) philosophy was taught at ATLS courses. These courses had only just been introduced to the UK, and were being supported by the Royal College of Surgeons of England.

I therefore sought out an ATLS course to attend as a confirmed sceptic. It is a tribute to the teaching and quality of that course (Guildford, since you ask) that I became convinced that ATLS, although “American” in flavour, had much to offer UK trauma care at that time. I also learnt that much of what is said in criticism of ATLS is said by people who know very little about it.

It is difficult to believe how disorganised much of the trauma care in the UK was at that time. Many small hospitals not far removed from the “community hospital” of the triage scenarios received seriously ill trauma victims with only a senior house officer in the casualty department, and no other post-registration doctor on site. Early resuscitation was haphazard and poorly coordinated.

ATLS courses, instructors, and providers began to be part of a change process, which improved the system considerably throughout the UK. This was not solely attributable to ATLS, but the introduction of these courses to areas provided a focus for interested local parties, and acted as a catalyst to encourage change and reorganisation. Alliances were forged for local clinical teams, and nationally between multiple specialties.

I feel we must also acknowledge the enormous contribution that ATLS has made to encouraging and developing the teaching of medicine and practical procedures. There were, to be sure, courses in education, but few offered the common sense and practicalities of an ATLS instructor course.

So ATLS became an integral part of UK medical training either through formalised and official courses, or in practical in-service teaching. The UK had, after an initial flirtation with a “fundamentalist” reading of the manual, generally accepted that the core system provided a logical guide to initial management of the trauma victim. The American focus of the manual even began to take over—although I have not been referred a “diaphoretic” patient, they have certainly been “obtunded” or “combative”. This was seen as an amusing quirk, which could, and would, be solved in future editions.

The American College of Surgeons (ACS) has been, however, slow to change much of the course content or materials. In many cases, that delay has been supported by subsequent research and clinical protocols—those who have loudly criticised the use of crystalloid solutions are less vociferous since the publication of the SAFE study from Australia, for example. Other changes did not seem to accept good evidence, which was passed to the ACS by members of the UK ATLS National Committee, which I was a member of for some years. For anaesthetists, the description of drug assisted intubation for adults and children remained contentious, and the lack of appreciation of the role of emergency physicians and anaesthetists in the management of trauma in the UK and other countries was frustrating.

The manual has been, where possible, evidence based, and therefore has rarely promoted new and unproven techniques. Some feel, however, that this has made the manual less up to date. Techniques that would bear introduction or discussion could include the use of restricted volume resuscitation as a part of care including early access to surgery, or damage control surgery and critical care involvement. These are certainly topics that are raised at UK courses, and their lack tends to detract from the title advanced trauma life support.

Do these concerns mean that we should leave the “ATLS family” and start a UK course? Like all those who threaten to leave the family home, perhaps we need to think clearly before acting.

ATLS still provides a strong, simple message, which is easily taught to all grades and disciplines. The UK and allied countries teach it in a way that emphasises the importance of its underlying principles, and tolerates and explains differences in US practice that are in the manual. The fundamental message is, I believe, still clear and relevant to our practice.

It would not be difficult to find a group of enthusiastic UK doctors with experience, and a real interest, in improving trauma care and teaching others to produce a manual more accurately aimed at UK practice. What would be difficult would be getting them to agree absolutely on a single approach, phrasing that unambiguously, and producing copy to a deadline with appropriate references. They would also have to agree to revise it all again to ensure the next edition of the manual was up to date.

The UK is not the centre of trauma care in the world. There are other groups of clinicians who also see similar patterns of trauma to the UK, with strong clinical and research links to themselves—both in Europe and Australasia. Any new teaching development should logically involve them in course development and expansion. We have much to learn from them—for example, I feel the best organised ATLS course system in the world is probably the Danish one.

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These groups of Europeans and Australasians currently are united in their wish to give constructive feedback to the ACS, with the aim of continuing to improve a course that has transformed trauma care worldwide. In many ways the course, which originated in the continental United States, has grown to provide a true international language of trauma care. However, that course desperately needs to more accurately reflect the variation in trauma patterns and systems existing outwith the USA.

I personally believe that it can do so, without diluting the overall message, if the ACS are willing to listen. I feel that they are beginning to appreciate that the overall teaching, course organisation, and quality control in the UK, Europe, and Australasia exceeds that of many of their courses. Guest ATLS instructors teaching on US courses are often disappointed at the quality of teaching and lack of coherent faculty involvement.

Perhaps the ACS should reflect on the similarities between the origins of their own great country—when the “colonials” expressed their concerns that a central and distant organising authority failed to appreciate the particular problems of local issues—and the expansion of a course that truly needs to be less American, and more international. A Boston Tea Party with consignment of course manuals to the bottom of the Atlantic should be avoided at all costs.

We should never fail to appreciate, however, the vision and enormous efforts of the originators of ATLS in the US, and the evangelical zeal that has made it the worldwide success that it undoubtedly is.

I conclude that, if the ACS were to show a serious willingness to take constructive feedback from European, Australasian, and other medical systems, a truly international trauma course could be produced that would build on the strong ATLS infrastructure present in many countries. To fail to do so risks destruction of the current international coalition of like minded trauma practitioners.

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