EMERGENCY CARE PARADIGM

ABC to <C>ABC: redefining the military trauma paradigm

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ABC has become established as the ubiquitous emergency care paradigm, reflected across the spectrum of advanced life support programmes. Military practitioners have been intuitively uncomfortable with this, as experience and evidence indicate that external peripheral haemorrhage is the leading cause of combat casualty death. In the UK military, ABC has now been replaced by <C>ABC, where <C> stands for catastrophic haemorrhage. The rationale for this change is explained in this commentary, together with its relevance to civilian practice.

Military ballistic injury is different from civilian blunt trauma. The nature of ballistic injury varies according to the type of weapon system causing the injury, the type of ballistic protection worn by the casualty and the nature of the conflict (urban, maritime or jungle). Although some injuries are inevitably unsurvivable, death may be avoidable in many cases, with rapid and decisive care at the point of wounding.

Champion *et al*[1] have estimated that 10% of all battlefield deaths are caused by haemorrhage from extremity wounds. On analysis of data from the Vietnam war, the Wound Data and Munitions Effectiveness Team identified that bleeding from limb wounds accounts for more than half the potentially preventable deaths in combat,[2] and that 7% of combat deaths may have been prevented by using a limb tourniquet. Contemporary experience from the Israeli Defence Force[3] confirms the pivotal role of external haemorrhage control in managing ballistic casualties, as does ongoing US and UK experience in Iraq.[4]

The UK Defence Medical Services has introduced several novel haemostatic products from April 2005. These are a new field-dressing, a self-applied arterial tourniquet and active haemostatic agents (Quikclot and HemCon). The background to this strategy has been described previously.[5] On evaluation of the novel haemostatics training programme for medical personnel immediately before their deployment, considerably improved confidence was seen in dealing with traumatic amputation injuries.[6] The continuing operational analysis of these products by military clinicians in Iraq and Afghanistan has repeatedly identified lives saved.[7]

The revised <C>ABC paradigm is the entry point to a common gateway in a new military publication guiding management for all medical emergencies on military operations. This encompasses trauma, medical, toxicological and environmental emergencies.[8]

Battlefield Advanced Trauma Life Support (BATLS)[9] has traditionally adhered closely to Advanced Trauma Life Support (ATLS) principles,[10] but has moved to <C>ABC for the management of military casualties with blast and ballistic injuries. The aim is to rapidly deal with life-threatening external bleeding using the field-dressing, tourniquet and topical haemostatic agents. When control of catastrophic haemorrhage has been achieved, ABC is dealt with along the conventional trauma paradigm.

Practical modifications to ATLS protocols for the military environment were described by Bellamy[11] for the 1991 Gulf conflict. Bellamy emphasised surgical airway management in destructive ballistic injuries of the face and de-emphasised cervical spine management in penetrating neck injury.

Modification of trauma care according to the tactical threat has been described by Butler *et al*.[12] A staged approach to trauma care is identified that includes Care Under Fire (a fire fight is ongoing), Tactical Field Care (the fight is over, but resources are limited) and Combat Casualty Evacuation Care (when the casualty is being extracted from the incident). These concepts have been propagated in the military edition of *Prehospital Trauma Life Support*.[13]

BATLS builds on the work of Bellamy and Butler. Although perhaps implicit in combat casualty care for some time, the <C>ABC paradigm formally recognises the importance of catastrophic haemorrhage. BATLS defines four stages of military trauma care that represent successive increments in the treating team's complexity and experience, available interventions and diagnostic tools: Care Under Fire, Tactical Field Care, Field Resuscitation (care at a regimental aid post by a primary care doctor and military medics) and Advanced Resuscitation (team of consultants at a field hospital). In these successive stages, BATLS also recognises that care needs to be modified according to the tactical threat. Although this sounds self-evident, the authors have all experienced situations in which prehospital providers have become fixated with carrying out a procedure (often intravenous access or spinal immobilisation) rather than moving to an appropriately safe location first.

Is this discussion relevant to UK civilian practice? The attacks of July 2005 in London and the resulting clinical experiences described[14] illustrate how blast and ballistic injury are a reality for today's National Health Service. The rescue of patients from a scene where an explosive or another threat is present or possible (including the more common house fire or a car fire) has clear parallels with Care Under Fire and Tactical Field Care.

Inner-city gunshot wounds and increasingly prevalent knife injuries are likely to present civilian prehospital and hospital personnel with casualties who may benefit from current military haemorrhage protocols, or adaptations of these. The parallels illustrate the need for civilian medical, nursing and paramedical personnel to be aware of innovations and developments in the military environment, where change is accelerated by the military imperative to improve combat casualty outcomes, and to adopt practices, where appropriate, to the benefit of the National Health Service.

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