A short history of Camp Bastion Hospital: preparing for war, national recognition and Bastion's legacy

David Vassallo

INTRODUCTION

Preparing for war

The successful outcome of so many patients managed at Camp Bastion Hospital, including the unprecedentedly high proportion of unexpected survivors discussed in the previous articles in this series,[1 2] owed much to the high-calibre multidisciplinary and collective training of medical services personnel before they deployed. This training built upon their individual skills and competencies, concentrating on non-technical skills (human factors), communication and team-working. The intent was to reduce to an absolute minimum the learning curve on individuals' arrival in the high-intensity environment that was Bastion (Figures 1 and 2). Perhaps the most significant innovations were the Military Operational Surgical Training (MOST) course for whole surgical teams and the Hospital Exercise (HOSPEX) training for all hospital staff.

The MOST course

> Surgeons currently deployed in Afghanistan face the daily task of treating military personnel suffering severe, complex injuries from bomb blasts or gunshot wounds—injuries they are likely to have limited experience of dealing with in NHS hospitals. MOST plays a very necessary part in ensuring that surgical teams about to deploy to Afghanistan are as prepared as possible for the work they are likely to be exposed to on a tour of duty. (John Black, President of the Royal College of Surgeons, England)[3]

Whole surgical teams came together before deployment to benefit from the MOST Courses run at the Royal College of Surgeons in London. This premier surgical simulation training course had evolved from the Definitive Surgical Trauma Skills course under the stimulus of how best to prepare complete surgical teams for deployment to Bastion or other war zones. The MOST course developed as an active collaboration between the Academic Department of Military Surgery & Trauma, the Royal Centre for Defence Medicine, Joint Medical Command and the Royal College of Surgeons of England.

The course delivers realistic surgical trauma training to complete teams, with general, orthopaedic and plastic surgeons training alongside anaesthetists, operating department practitioners, theatre nurses and emergency physicians. It ensures that they gain the necessary experience and competencies in the key tenets of damage control resuscitation and combat surgery before facing battlefield trauma for real. It has revolutionised the ability of the military medical services to pass on individual and institutional memory of these skills, which had so often been lost after previous conflicts.

Its value was recognised nationally when the MOST course won the prestigious Education and Training award at the Department of Health Military and Civilian Health Partnership Awards in November 2010.[3] The course continues to flourish, in anticipation of future conflicts.

The HOSPEX trainer at Strensall, York

> This facility has delivered continuity between Bastion hospital staff, it has ensured that a patient is as safe on the first day of the new hospital team as he or she is on the last day of the old one. The people we have and the processes they employ are what make our outcomes the envy of the world, but this facility has kept us there. (Lieutenant Colonel Andy Griffiths, clinical director at Army Medical Services Training Centre (AMSTC), Strensall, 2011–2014)[4]

All hospital staff (including attached US, Danish, Estonian and civilian personnel) undertook two separate 3-day periods of fully immersive whole hospital live-in simulation training at the AMSTC in Strensall Barracks, York, in a reconfigurable life-size mock-up of Bastion Hospital, the HOSPEX trainer (Figure 3). The HOSPEX training programme had undergone progressive refinement since its inception in 2003 following Op TELIC 1 and the recognition of the need to radically transform pre-deployment training to make field hospitals fit for role.[5] HOSPEX training modelled casualty flows throughout the hospital and focused on developing crucial non-technical skills (human factors), with emphasis on communication, situational awareness, leadership, followership and teamwork.[6–8] HOSPEX exercised both clinical and Command staff, and the Medical Emergency Response Teams (MERT) were tested in a full-size mock-up of a *Chinook* helicopter.

These two assessment and validation periods effectively tested the organisational 'fitness for purpose' of Reserve and Regular field hospitals deploying to Bastion. They provided an unprecedented level of assurance for governance purposes, including hard evidence that key cognitive and non-technical team skills (especially critical decision-making and situational awareness) learned at HOSPEX were retained throughout participants' deployment in Bastion weeks or months later, and were all transferrable to civilian practice.[9]

The HOSPEX trainer is readily adaptable to other clinical scenarios, for instance being rapidly transformed to prepare military and civilian hospital staff deploying to Sierra Leone from October 2014 onwards to combat the Ebola outbreak in West Africa. The HOSPEX trainer effectively went from being the best trauma hospital simulator in the world to the best Ebola treatment facility simulator in the space of a few weeks (Major Chris Gibson, Chief Instructor AMSTC, personal communication, April 2015).

HOSPEX Tabletop exercises

HOSPEX Tabletop exercises using sets of casualty cards for different scenarios (each flip-over card representing a casualty's clinical condition at different stages of care), staff cards based on actual hospital establishments and accurate maps of Bastion Hospital[1] also played a role in preparation for deployment. These HOSPEX Tabletop exercises had originally been developed at the Royal Hospital Haslar in collaboration with the Academic Departments of Military Surgery and Emergency Medicine to enhance pre-deployment training for field hospitals following analysis of the Nis Express major incident in Kosovo in 2001.[10] These exercises used current trauma protocols and were largely based on real clinical cases and major incidents. They have been updated regularly and produced through Army Graphics Andover following the closure of Haslar, with layout maps developed for tented field hospitals and BMH Shaibah in Iraq, a forward operating base, the different hospital configurations at Bastion, and now the various configurations of the Very High Readiness field

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Figure 1 *Medical Treatment Facility at Camp Bastion* (David Rowlands, artist).

hospital. Extended Tabletop exercises were also occasionally carried out within Territorial Army drill halls. The tabletop exercises proved particularly useful in helping clinical and command staff appreciate the bigger picture and in preparing for major incidents, using Military Hospital Major Incident Medical Management and Support principles.

Data collection, analysis and feedback

The major concurrent developments enhancing pre-deployment training as well as progressively improving clinical outcomes were in data collection, analysis and feedback—the development of robust clinical governance. Lessons from the weekly Joint Theatre Clinical Case Conferences (JTCCC) and the Joint Theatre Trauma Registry (JTTR) were used to inform the clinical scenarios on HOSPEX and keep them current.

The JTCCC was established in Bastion in 2007; it was a multidisciplinary telephone conference between the Role 3 hospital in Camp Bastion and the Role 4 hospital in Birmingham, chaired and controlled by the Royal Centre for Defence

Figure 2 *Damage Control Resuscitation in the Emergency Department, Bastion* (Gora Pathak, surgeon and artist).

Figure 3 HOSPEX – the field hospital macrosimulation trainer, Strensall (Emergency Department in foreground).

Medicine, also linking in with Permanent Joint Headquarters, other theatres of operation (such as Iraq and Cyprus) and Headley Court, which discussed the management of current casualties. It provided a forum for near-real-time feedback and ensured that urgent clinical lessons were immediately applied.[11]

The JTTR collects data on all seriously injured patients treated by the UK Defence Medical Services in deployed UK field hospitals or medical facilities afloat. It was first established on deployment of a UK field hospital to Kosovo in 1999. The registry was formerly maintained by the Academic Department of Military Emergency Medicine at the Royal Centre for Defence Medicine in Birmingham,

Table 1 US Contingent at Camp Bastion Hospital, 2009–2014

The US Contingent comprised 40–100 individuals on 6-month tours, filling clinical, aeromed, mortuary and admin roles The US Bastion Contingent was TACON to the UK (ie, under UK tactical command) as part of the NATO mission, through a legal 'technical agreement'	Officer in Charge/Deputy Deployed Medical Director (these roles were combined until HERRICK 15)	US administrative support provided by Task Force Med (Afghanistan)—this headquarters was formed from the command element of the US Navy (at Kandahar) or Army Combat Support Hospital (10th Combat Support Hospital based at Dwyer, thereafter each CSH provided Task Force Med based as shown below)
HERRICK 10 (April–October 2009) (The first US contingent arrived in May 2009)	CAPT Joe Rappold	US Navy: based in Kandahar
HERRICK 11 (October 09–April 10)	CAPT Kenneth Kelleher	The US Navy took over command of the NATO Role 3 Hospital in Kandahar from Canadian Forces on 15 October 2009
HERRICK 12 (April–October 10)	CDR Carlos Rodriguez	US Navy
HERRICK 13 (October 10—April 11)	CDR Angela Earley	US Navy
HERRICK 14 (April–October 11)	CDR William Dutton	US Navy
HERRICK 15 (October 11–April 12)	LTC Richard Lindsay DDMD: LTC Thomas Starkey	10th CSH (Fort Carson, Colorado) (October 11–October 12; at Dwyer) (the US Army took over responsibility from the US Navy for US medical support to Helmand from HERRICK 15 on)
HERRICK 16 (April–October 12)	OIC: LTC Richard Lindsay DDMD: LTC Brian Sonka	10th CSH, as above
HERRICK 17 (October 12–April 13)	OIC: LTC Ron Walker DDMD: LTC Eric Osborn	14th CSH (Fort Benning, Georgia) (October 12–April 13; HQ based at Kandahar)
HERRICK 18 (April–October 13)	OIC: COL Eric Helling DDMD: LTC Jeremy Pamplin	28th CSH (Fort Bragg, North Carolina) (May 13–February 14; HQ based at Kandahar and then Bagram)
HERRICK 19 (October 13–April 14)	OIC: COL Michael Wirt DDMD: LTC Jay Bucci	31st CSH (Fort Bliss, Texas) (TF 31 Medical, February–September 14; HQ based at Bagram and then Kabul from June 14)
HERRICK 20 (April–September 14) (BSN Hospital closed 22 September)	OIC: LTC Eric Newland DDMD: LTC Kyle Remick	31st CSH, as above

and latterly Defence Analytical Services and Advice. The JTTR is fundamentally a quality assurance system designed to detect unexpected outcomes (such as unexpected survivors or deaths, complications, adverse events or emerging injury patterns) in order to maintain and develop standards of care in real time (T Hodgetts. A revolutionary approach to improving combat casualty care, unpublished doctoral thesis, City University London, 2012. http://openaccess.city.ac.uk/2040/ (accessed 15 January 2015)).

The records held within the JTTR show a progressive improvement in survival in UK combat casualties during the 10-year period 2003–2012, with a proportionate increase in the numbers of 'unexpected survivors', many of whom were treated at Bastion: the New Injury Severity Score associated with a 50% chance of survival rose each year from 32 in 2003 to 60 in 2012.[12] This was a testimony to the efforts of so many committed Service personnel in transforming the Defence Medical Services into a world class organisation since its nadir in 1997 following the cutbacks of the 1994 Defence spending review, and a tribute to the efforts of the US, Danish and Estonian contingents co-located with the British at Bastion.

National recognition and lessons for the NHS

As a crucial part of the military trauma system, Camp Bastion Hospital featured a number of unique, evolutionary and at times revolutionary approaches to trauma care that have deservedly been nationally acclaimed and that have had a significant influence on the implementation of Level 1 Trauma Centres in the National Health Service (NHS) in the UK in the past few years.

The Healthcare Commission report of 2009 described the military trauma system as 'exemplary', commenting "… the results achieved in the management of the injured soldier in the current conflicts are the best ever reported … this is a truly remarkable achievement" (Mr John Black, President, Royal College of Surgeons).[13]

The National Audit Office examined casualty records from Bastion for the 6 months to October 2009 (the busiest time in its existence, when injury and fatality rates for Op HERRICK were at their highest) and issued its report in 2010.[14] It specifically commended Camp Bastion Hospital, within the overall military medical system of casualty care, for the following contributions to trauma care:

- unprecedented numbers of unexpected survivors after major trauma (this is the benchmark for the quality of casualty care on operations—the National Audit Office calculated the rate at Bastion to be up to 25%, an exemplary level far better than the 6% achieved in the best NHS facilities);
- the layout of the hospital specifically being designed to deal with trauma casualties;
- consultant-led multidisciplinary trauma teams;
- strong Hospital Governance Arrangements;
- numerous developments in the protocols for treating major trauma.

The House of Commons Defence Committee, in its 2011 review of the Armed Forces Covenant, focusing on military casualties, commented on "the extraordinary quality of care given to our Armed Forces almost from the point of wounding" and commended the Armed Forces medical services "for the improvement in all aspects of the medical treatment of injured personnel in theatre".[15]

It is important to understand that Camp Bastion Hospital, as all military field hospitals, was designed explicitly as a way point for the early resuscitation and stabilisation of trauma cases pending aeromedical evacuation to the UK, rather than for the definitive treatment of casualties. Nevertheless, many Afghans (primarily members of the Afghan security forces, but also civilians (including many children) and even Taliban fighters) received definitive treatment at the hospital.

Pask Certificate of Honour

In recognition of the key role played by anaesthetists at every stage of the evacuation chain of casualties from Afghanistan, from prehospital care, resuscitation, anaesthesia, intensive care, pain management and aeromedical evacuation, through to command roles as Deployed Medical Directors, the Council of the Association of Anaesthetists of Great Britain and Ireland (AAGBI) awarded its prestigious Pask Certificate of Honour in 2012 to all Defence Anaesthetists that had served in Afghanistan.[16] After the cessation of British combat operations in Afghanistan, the AAGBI repeated this honour by awarding the Pask Certificate in January 2015 to a further 21 Defence anaesthetists who had served in Afghanistan since the time of the first award. In doing so, it recognised that all the individuals who received the awards in 2012 and 2015 "have served and continue to serve their patients, Defence Anaesthesia, the Defence Medical Services and their Country with loyalty, dedication and honour".[17]

The transformation of the Defence Medical Services

The stimulus of major conflict in Iraq and Afghanistan over the last 15 years has resulted in a combination of technological advances, operational innovation, organisational adaptation and doctrinal changes that have caused a radical change in the character and practice of military medicine, amounting to a genuine revolution in military medical affairs (T Hodgetts, unpublished doctoral thesis, 2012). Bastion Hospital has played a catalytic role in this transformation.

Multinational collaboration

A very successful feature of Bastion Hospital was its multinational composition, particularly following the arrival of the first US contingent in May 2009, with Danes and Estonians having added to the eclectic mix since 2007 (and with the Danes providing a field hospital squadron on HERRICK 10B in 2009). The US contingent consisted of individual augmentees drawn from many units and commands across the world (including Navy, Army, Marine Corps and Air Force). They provided up to half the Bastion clinical staff, as well as providing continuity over their 6-month tours, compared to the 3 months (or less) of many of the UK clinical staff, with their head of contingent filling the role of Deputy Deployed Medical Director until the roles were separated (Table 1). The overall result was very positive, despite occasional friction usually generated from the stress of treating the severely combat wounded, with a great *esprit de corps* boding well for future cooperation. In its final 18 months, Bastion Hospital also provided US and UK mentoring teams to the Afghan National Security Forces' medical facility at Camp Shorabak.

Learning the lessons from Bastion Hospital

The major challenge now (and one that has been faced by the British Army Medical Services in the aftermath of every major conflict since the Crimean War)[18] is to ensure that the lessons learned in developing an effective and fully integrated trauma care system are not forgotten by the time of the next conflict.[19] The best and most enduring way to ensure this, in an organisation with frequent turnover of personnel, which is moreover in a period of readjustment after operations and

Figure 4 *The Patient's Journey* (Tony Green, artist and member of 202 Field Hospital, HERRICK 10A).

simultaneously reducing in numbers, is to embed these lessons into doctrine, lessons-learned processes and training.[20] The Defence Medical Services have taken this to heart.

Bastion Hospital represents only one part, albeit a large and very important part, of a continuum of sophisticated medical care of the casualty from point of injury to eventual recovery in the UK (Figure 4). This continuum of care is now known in the Defence Medical Services as the Operational Patient Care Pathway.[21 22]

The concept of the Operational Patient Care Pathway encompasses Pre-Hospital Care and Deployed Hospital Care. It seeks to embed the medical lessons from the last 15 years of military operations (many of them outlined in this series) into concepts and doctrine for the Defence Medical Services of the future. Underpinning concepts include Care Under Fire, Tactical Field Care, Enhanced Field Care, Prolonged Field Care, Progressive Resuscitation, Damage Control and In-Theatre Surgery, and Enhanced Diagnostics. Time will tell how effectively these core concepts and doctrines distilled from experience in Iraq and Afghanistan are transmitted to the generation of medics that now follows us, with the aid of the lessons-learned processes and training programmes outlined in this article.

CONCLUSIONS

Over the 8 years of its operation, 13 000 casualties were extracted from the battlefield to Bastion Hospital by the Chinook Force, mainly by the MERT.[23] Some 14 000 UK personnel were seen and treated at Camp Bastion Hospital, along with US and other Coalition partners and very large numbers of Afghans. Of these, 2600 were major trauma cases; 15 500 L of blood were transfused, 39 500 CT scans and 50 000 x-rays were taken and 4500 personnel were evacuated by Critical Care Air Support Teams to the UK.[24]

Within these complex multidisciplinary deployments, a significant number of British Regular and Reserve health professionals, largely drawn from NHS hospitals, contributed to the work of the trauma teams at Bastion Hospital, to training and research, and to the growing reputation of the Hospital during its operational phase. Many new skills and concepts were learned, which have subsequently informed the development of the NHS trauma service and military medicine worldwide.

The extraordinary experience of working at Camp Bastion Hospital will undoubtedly live long in the memories of all who have served there.

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Notes