

# A short history of Camp Bastion Hospital: part 2—Bastion's catalytic role in advancing combat casualty care

David Vassallo

## INTRODUCTION

### It's all about the casualties

*"They took me to Camp Bastion, the field hospital, which took about twenty minutes. Once I reached it, they took me directly into the operating theatre and the last thing I remember was a nurse talking to me. She said to me, 'Derek, be strong, you're going to be OK.'"*—a personal account of 'right turn resuscitation' by Private Derek Derenalagi, blown up by an improvised explosive device (IED) on 19 July 2007, suffering a bilateral transfemoral amputation, and subsequently classified as an 'unexpected survivor'.<sup>1</sup>

A remarkable and inspiring photo-essay book appeared in 2013, featuring the personal accounts of 36 severely injured soldiers and marines who, in the words of General the Lord Dannatt, have "risen above the hurt their enemies thought they had inflicted on them".<sup>2</sup>

Twenty-seven of these servicemen were injured in Afghanistan and had been evacuated from the battlefield to Bastion, where they were managed for less than one day or two at most, before being evacuated to Birmingham. It is obvious from their stories that by all rights many of them should not have lived to tell their tale, but their recollections from Bastion are tantalisingly hazy as most were sedated or anaesthetised *en route* or on arrival there, waking up days or weeks later in the intensive therapy unit (ITU) in Birmingham.

This article covers the care these servicemen and others would have received in that 24 h gap in their testimonials, during their extraction from the battlefield and after arrival in Bastion, the care that in those crucial few hours enabled them to join that unique fraternity—the unexpected survivors of Afghanistan.

## COMBAT CASUALTY CARE

### The doctrinal revolution underpinning casualty care in Helmand

The paradigm shift in combat casualty care that occurred in 2005 shortly before

British troops deployed into Helmand Province and which was to underpin every aspect of casualty care there was the formal recognition that catastrophic haemorrhage, designated as <C>, was the major killer on the battlefield and needed to be attended to immediately, even ahead of managing the airway.<sup>3</sup> This led to the concept of <C> ABC, the acceptance of tourniquets in the military setting, which were introduced widely from Op HERRICK 4 in 2006 onwards, novel haemostatic dressings and the development of the 'damage control resuscitation—damage control surgery' sequence. Importantly, the rapid spread of conceptual knowledge and experience across the DMS soon resulted in a critical mass of highly motivated individuals who could drive further change, and their proving ground was Bastion. A whole raft of other innovations ensued, such as near point coagulation testing in the form of thromboelastometry (ROTEM), introduced to Bastion on a feasibility study in 2009,<sup>4</sup> and soon fully integrated into damage control resuscitation,<sup>5</sup> followed by doctrinal and organisational changes.<sup>6</sup>

### Casualty retrieval: Bastion's Medical Emergency Response Teams

*"Then the Chinook helicopter came in to try and get me. It was a huge relief to see it, but then a rocket-propelled grenade was fired at it. You're not allowed to land under fire, so it withdrew and circled overhead. That's when I thought, 'I'm actually going to die here.'... Then the Apache turned up, and rained fire down on the location, taking out the Taliban so that the Chinook could come back in and land."*—a personal account by Private Stringer, blown up by an IED on 19 January 2011. He is a triple amputee and 'unexpected survivor'.<sup>7</sup>

Camp Bastion Hospital was the principal link in the evacuation chain from the battlegrounds of Helmand, pivotal to which from the outset were the iconic British Medical Emergency Response Teams (MERT) based at the hospital. For speed of evacuation, and because road transport was fraught with the risks of IEDs, almost all patients were brought to

Bastion Hospital by helicopter, landing at its aptly named Helicopter Landing Site 'Nightingale'.

The MERT was a revolutionary concept, taking the most experienced healthcare professionals directly to the most critically wounded on the battlefield, which was introduced to Afghanistan on Op HERRICK 4. It had evolved from the Incident Response Teams of the Balkan conflicts of the 1990s and the Iraq campaign.

The larger capacity of the Royal Air Force's (RAF) sturdy *CH-47 Chinook*, which could accommodate 8 stretcher patients and 20 walking wounded, carry more equipment and a force protection team, and still have space to provide care to casualties, meant it was preferred for casualty evacuation over all other helicopters (Figure 1).<sup>8</sup> The *Chinook* allowed the specially developed MERT, consisting of a consultant in anaesthesia or emergency medicine, a nurse and two paramedics, to be carried forward of the hospital to provide in-flight casualty care and advanced resuscitation. This eventually included in-flight blood transfusion, which was perhaps the most critical innovation.

American medevac flights, which supplemented British medevac missions from 2009 onwards, were carried out by US Army *UH-60A Blackhawk* helicopters (known as DUSTOFF) and USAF *HH-60 Pave Hawk* helicopters (known as PEDRO). These had a quicker response time, better night operability and could fly into 'hot zones' at less collective risk, but they had limited capacity and significantly only carried one or two paramedics respectively, so the US Department of Defense recognised that they could not match the MERT's capability.<sup>9</sup>

Intelligent tasking of these three different aeromedical assets contributed to the physician-led MERT transporting a higher proportion of critically injured casualties, a decision justified by the MERT achieving greater than predicted survival rates (Figure 2).<sup>10</sup>

### Trauma teams and human factors at Bastion

The large multidisciplinary 'Complex Trauma Teams' at Bastion allowed consultant-delivered care from the 'front door' of the emergency department (ED) (Figures 3 and 4), ensuring experienced, early, robust decision-making for these critically injured casualties.

There would typically be at least 17 members in the trauma team with all the medical roles filled by consultants

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**Figure 1** *In Safe Hands* Medical Emergency Response Team in action (Stuart Brown).

excepting the primary survey doctor who was usually the ED specialist registrar (Figure 5). The team consisted of a Team Leader who was the ED consultant, a Primary Survey Doctor, two anaesthetists for airway and central venous access, an operating department practitioner, scribe, trauma nurse coordinator, four ED nurses for intravenous access and first blood sample, drugs and rapid infuser ( $\times 2$ ), a runner, orthopaedic, general and plastic surgeons, a radiologist and radiographer and the deployed medical director (DMD). Logistic support would be provided by the laboratory technician, theatre manager and Ward Master, while ‘front of house’ support would be provided by an interpreter, the Squadron Sergeant Major and the Padre.<sup>11</sup>

Much of the success of these teams was due to exemplary human factors (non-

technical skills) rehearsed and consolidated in pre-deployment training and honed at Bastion, with emphasis on communication, situational awareness, leadership, followership and teamwork.<sup>12 13</sup>

#### Deployed medical directors

Advances in prehospital medicine and damage control resuscitation and surgery, the rapid evacuation of critically and massively wounded personnel to Bastion Hospital, the multinational and interdisciplinary challenges of clinical innovations, and the high-intensity workload at this specialist trauma hospital led to the formal development of the role of the DMD in 2009. The DMD worked within the administrative command structure, alongside the Commanding Officer and the Senior Nursing Officer.<sup>14</sup>

DMDs played a crucial coordinating role in meeting these many challenges, smoothing professional interactions, maintaining and developing clinical standards and addressing ethical dilemmas and governance issues from one roulement of hospital staff to another. Moreover, the DMD was the interface between the ‘first world’ facilities at Bastion and the several Afghan civilian, charitable and military medical facilities. The movement of local national casualties and patients, in and out of Bastion, posed significant ethical and logistic challenges for the DMD and the military medical command teams (Figure 6).

The DMD was also the interface with other allied hospitals in theatre, especially when it came to transferring casualties for urgent specialist care. Camp Bastion Hospital was but one component (albeit the busiest) in a complex and interdependent multinational network of centres of excellence that included the Canadian/US Hospital at Kandahar for the treatment of neurosurgical and maxillofacial casualties (a facility that included British surgeons),<sup>15</sup> the American hospital in Bagram and the French Hospital in Kabul for eye casualties.

#### Damage control radiology

While CT scanning had been part of Bastion Hospital’s armamentarium since June 2007, consultant radiology input to Bastion had initially been limited to tele-radiology support from the UK. In 2009, consultant radiologists became part of the complement of British field hospitals. An American consultant radiologist deployed to Bastion with the first US contingent on Op HERRICK 10A (2009), and in May that year a British radiologist was also added to the establishment, with radiologists being included in the trauma team. Consultant-performed Focused

**Figure 2** Medical Emergency Response Team with casualty arriving at Nightingale helipad, Camp Bastion Hospital (Graeme Lothian).





signature injury pattern, with the surgical workload changing considerably as a result.<sup>18</sup>

Rapid helicopter evacuation of casualties with MERT resuscitation *en route* resulted in such patients usually arriving alive in Bastion, but at the limits of their physiological reserve. Critical decision-making by experienced consultants in emergency medicine, anaesthesia and surgery, coupled with damage control resuscitation, with massive transfusion according to strict protocols,<sup>11</sup> including the novel and effective use of tranexamic acid and cryoprecipitate,<sup>19</sup> damage control surgery and radiology, all contributed to achieve unprecedented survival rates for these hugely traumatised casualties. Overall 98% of those who made it alive to Bastion survived.<sup>20</sup> Between April 2006 and July 2008, there were 75 unexpected survivors out of nearly 300 severe trauma cases presenting to Iraq and Afghanistan,<sup>21 22</sup> this 25% ratio being in stark contrast to the best National Health Service ratio of 6%, and this remarkable ratio was maintained in Bastion through later years. By the end of 2011, Surgeon Vice-Admiral Raffaelli, the Surgeon General, could report to the House of Commons that there had been some 210 'unexpected survivors' in the previous five years,<sup>23</sup> and by the end of conflict operations in 2014 it is estimated that there have been some 300 in all.

#### Right turn resuscitation

The concept of selective 'right turn resuscitation' was introduced in Bastion on Op HERRICK 7 in 2007 and refined thereafter.<sup>24</sup> It was the process whereby critically unstable casualties identified *en route* to hospital would bypass the emergency room altogether, going directly into the operating theatre for surgical control of proximal haemorrhage, followed by rapid CT imaging, ongoing resuscitation and a short period of ITU stabilisation. This would usually be followed by a return to theatre for further damage control surgery (Figure 9). The 'right turn' reflected the geographical location of the Bastion theatres on the right side of the ED corridor, but its ethos symbolised taking the right decision for the right patient at the right time followed by the right response.

#### Casualties under 16 years old

Only those who have never deployed to war could assume that casualties dealt with by a military hospital are all adult combatants. Civilians—men and women, the elderly, children and babies—formed a

**Figure 3** Arrival of ambulance at Bastion Hospital (Gora Pathak, watercolour).

Abdominal Sonography for Trauma, and direct digital X-ray facilities (Figure 7), soon added their contribution to trauma resuscitation.

The first CT scanner ever to be deployed in a British field hospital had been installed at British Military Hospital Shaibah in Iraq in 2005. When one realises that the first 100 CT scans at BMH Shaibah were taken over a 13-month period, followed by 66 scans in July 2007, and then compares this with the 100 trauma CT scans performed at Bastion in a 10-day period alone in July 2010, one can better appreciate both the vastly different tempo of war fighting between the two theatres and the clinical

utility of rapid CT in the evaluation of trauma (Figure 8).<sup>16</sup>

#### Damage control resuscitation and damage control surgery at Bastion

Gunshot wounds accounted for the majority of trauma patients received at Bastion Hospital in 2006–2007. Thereafter, the Taliban insurgency adapted its modus operandi to deploy increasingly sophisticated and effective IEDs, which became the signature weapon of the Afghan conflict.<sup>17</sup> IEDs caused >60% of all UK fatalities in Afghanistan. The high (often bilateral) transfemoral amputation with mutilating perineal and significant pelvic injury became the



**Figure 4** Unloading casualties at Bastion Hospital, 2010 (Graeme Lothian).



**Figure 5** Consultant-led multidisciplinary trauma team at Bastion (Graeme Lothian).

significant proportion of Bastion's workload. Captain Abi Hoyle, paediatric trainee and Reservist, remembers "Despite all the preparation I still started with a shock. Whilst ... filling the three hours till my hospital induction, I was literally grabbed. '6 x Category A paediatrics 5 minutes out, ED want you'".<sup>25</sup> Category A is the NATO triage classification for the most urgent casualties.

Paediatric trauma accounted for almost 15% of all operating theatre cases from May 2006–May 2008,<sup>26</sup> and for up to 30% of all critical care bed occupancy, with 25% of all paediatric admissions being <2 years of age.<sup>27</sup> There were 112 paediatric admissions to intensive care from April 2011 to April 2012 (45 of them being due to IEDs), accounting for just under 15% of all admissions to ITU

(Figure 10).<sup>28</sup> The challenges were demanding, especially when considering that while wounded coalition soldiers were normally evacuated to UK within 24 h of admission to ITU, there was no rearward evacuation chain for children, who usually had to be kept in until discharged home.

#### Military medicine is not all surgery

While the focus of Bastion Hospital was firmly on the management of battle casualties, the majority of patients presenting to medical care actually suffered from infectious diseases or non-battle injuries, some of which were life-threatening. This has always been the case in the history of warfare, and Afghanistan was no exception,<sup>29</sup> with the challenges facing military physicians on this deployment being well

documented.<sup>30</sup> Military medicine has firmly placed itself on the front stage again with 22 Field Hospital, 5 Medical Regiment and RFA *Argus* deploying to Sierra Leone in October 2014 on Op GRITROCK, within days of Bastion Hospital closing, as part of the UK's response to the Ebola crisis in West Africa.

#### Behind the scenes at Bastion Hospital

In his first seven days at Camp Bastion, he saw 174 casualties brought into the military hospital. Six were already dead and 23 needed amputations. The small state-of-the-art hospital uses more blood products than all of Scotland. (Dr Mark de Rond, 2012)<sup>31</sup>

From 2006 until beyond the closure of the hospital on 22 September 2014, there has been intense media interest in the activities of Bastion Hospital as it built up a reputation as the best trauma hospital in the world. A number of documentary films (often uploaded to YouTube, a facility not available in any previous conflict) featured the hospital and the retrieval of casualties from the battlefield, and they give a unique insight into modern combat casualty care and the work of the military medical services.

These films range in scope from a Cambridge University academic's evaluation of Bastion's high-performance teamwork,<sup>32</sup> to ITV's 2009 three-part documentary series from Bastion, *Doctors and Nurses at War*.<sup>33</sup> Individual films featuring Bastion cover every aspect of the patient's journey, almost all the following being available on YouTube: evacuation from the battlefield to the ED, the MERT, casualty care, the advances of military medicine, the work and experiences of emergency medicine nurses, biomedical scientists in the pathology lab and blood bank, theatre nurses, ward nurses, the trauma surgeons, operating department practitioners, radiologists, through aero-medical evacuation to Role 4 care in Birmingham and rehabilitation at Headley Court, and finally the hospital's last days as it transferred responsibility for care to the new Afghan Trauma facility at Camp Shorabak.

Media coverage was not limited to films. Following the closure of Bastion Hospital, the BBC World Service and BBC Radio 4 commemorated its achievements in a series of radio broadcasts, aptly titled *Trauma at War*, and *Trauma Medicine—The Fight for Life*, accessible via the BBC website.



**Figure 6** Deployed medical director on morning ward round at Bastion (Gora Pathak, watercolour).



**Figure 7** Direct digital radiography at Bastion, 2010 (Graeme Lothian).



**Figure 8** CT scanner in use at Bastion Hospital (Graeme Lothian).

**Figure 9** Bastion operating theatre (Graeme Lothian).



### The world's toughest parish? Chaplains at Bastion

The environment at Bastion, where the staff faced a daily and sometimes unrelenting stream of deliberately injured casualties and fatalities with horrific injuries, presented tough emotional and ethical challenges that tested even the most hardened individuals. The hospital chaplains were an integral and much-valued part of the trauma team:

I arrived in Camp Bastion [in January 2012] to find my life as a priest would assume a vastly different appearance to the norm back home... Compared to visiting NHS hospitals where a chaplain may sometimes feel outside of the whole care structure, this environment by contrast seems to draw the chaplain to the very core of its existence. Staff here actively and generously draw me in and seek me out. It would seem that the chaplain is very much an integral part of the hospital's care structure, and my presence here is largely respected and warmly received by colleagues and patients alike.

Often I have found myself in the thick of trauma which comes directly from the battlefield. Soldiers of all nationalities are a tough bunch and they sustain some of the worst and therefore some of the most life changing injuries from their hazardous profession. Yet they remain the most stoical and dedicated of individuals and live to serve and look out for one another; a blood tie of fraternal dependence.

As a chaplain to the sick, the wounded and the dying I have found in them and in the staff who care so carefully for



**Figure 10** Bastion Hospital intensive therapy unit—a testimony to multinational cooperation (Graeme Lothian).

them, a glimpse of the divine presence of God. (Personal account by The Reverend Paul McCourt CF (V), Roman Catholic Chaplain to 201 (Northern) Field Hospital (V))<sup>34</sup>

One of the hospital chaplains at Bastion, Padre Giles Legood, was awarded the MBE after his four months there in 2013, for “giving his all to support the Nation’s wounded” and for his “unwavering belief in the face of adversity”, thereby becoming the first RAF chaplain to receive an operational honour since World War II.<sup>35</sup>

### Strategic aeromedical evacuation

Once stabilised at Bastion, British and Allied casualties (including ventilated

casualties with attendant ITU trained staff from the RAF’s Critical Care Air Support Teams) were evacuated by aircraft, initially to Kandahar airfield for onward carriage to the UK, and later directly to the UK from Camp Bastion, in appropriately modified TriStar or Boeing C17 aircraft (Figure 11). Critically ill casualties would usually have left Bastion within 24 h of injury. The UK receiving Airhead was at Birmingham International Airport, from where they would go to Selly Oak Hospital, or from 2010 to the new Queen Elizabeth Hospital, Birmingham. In due course, these casualties would go to the Defence Medical Rehabilitation Centre at Headley Court where their recovery would start in earnest.



**Figure 11** Strategic aeromedical evacuation from Bastion Hospital (Graeme Lothian).

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