ORIGINAL PAPERS

The Joint Theatre Clinical Case Conference (JTCCC): Clinical governance in action

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Abstract

Objectives: To quantify the type and nature of the lessons and issues arising from the Joint Theatre Clinical Case Conference
Methods: An evaluation of all JTCCC minutes from inception on 30 Mar 07 to 05 Jun 08 (n=61) was performed in Jul 08. Each separate issue (n=207) was assigned a NATO 'J' category and further sub-divided into clinical and non-clinical issues. Detail of whether the issues were raised for information only, or required action to be taken was recorded, as was the outcome of this action.
Results: A wide range of clinical and non-clinical issues (J1-J8), were identified. 23% (47) of the 207 issues were raised for information only. 77% (160) issues required action to be taken. 109 were closed within 3 weeks. 23 took more than 3 weeks to close. Eight weeks after the study period 28 issues were still being actively resolved. 85% of JTCCC teleconferences had full participation from both theatres. Technical difficulties and/or the treatment of casualties prevented the participation of one or both theatres on 9 occasions.
Conclusions: JTCCC supports deployed clinicians and enables rapid resolution of issues affecting combat casualty care. It is limited by its focus on UK casualties only. Although intended as a Clinical Governance tool the evidence of this review is that JTCCC has wider effects in a number of clinical and non-clinical areas.

Introduction

The Joint Theatre Clinical Case Conference (JTCCC) was established by the Defence Professor of Emergency Medicine whilst deployed on Operation HERRICK (UK combat operations in Afghanistan) in March 2007 with the intention of creating a structure for clinical feedback on the management of seriously injured UK Service personnel. It was hoped to achieve near real-time capture of clinical operational problems encountered and lessons learned.

JTCCC is a weekly telephone conference between the Royal Centre for Defence Medicine (University Hospital Birmingham, UHB), field hospitals in Southern Afghanistan (the UK field hospital in Camp Bastion; and since 2009 including the Canadian field hospital in Kandahar), RAF Brize Norton (Aeromedical Evacuation Coordination Centre, AECC) and the Defence Medical Rehabilitation Centre Headley Court. The UK field hospital in Iraq (Operation TELIC) was a participant until its closure in 2009.

Since July 2008, Permanent Joint Headquarters (PJHQ), the organisation controlling all UK military operations overseas and Headquarters 2 Medical Brigade, the organisation responsible for commanding and preparing all UK field hospitals, both regular and reserve, have joined as standing conference members.

The conference takes place on a Thursday morning at 0830hrs in UHB using a star phone and British Telecom's Meet Me® facility. This allows up to 10 locations to dial in, with deployed locations connecting via the Whitehall switchboard. Multiple participants are routinely present at each of the clinical locations, providing a multi-disciplinary input.

Prior to 2005 there was no system in place for formal operational clinical feedback, which instead was ad hoc and relied on personal networks. In 2005 there was both an expansion in manpower at RCDM to undertake trauma audit and the formal introduction of deployed Trauma Nurse Co-ordinators (TNCs). This encouraged improved feedback from the Academic Department of Military Emergency Medicine (ADMEM), but it remained loosely structured until March 2007.

JTCCC is the first formal clinical feedback system used by the UK Defence Medical Services (DMS), and augments the other trauma governance systems currently in place [1]. Clinical information to support JTCCC is a combination of quality assurance data collected by TNC, both deployed on operations and at RCDM. Written feedback is prepared and distributed by ADMEM 24 hours in advance of the conference, following the weekly Tuesday military consultant-led ward round at University Hospital Birmingham (UHB). Detailed minutes are distributed weekly and include descriptions of individual case injury patterns, treatment and complications. A number is generated on admission to a UK field hospital (the FMED 830 number), which is used as the patient identifier to refer to all cases anonymously.

Minutes are sent to military e-mail addresses only, on a distribution limited to those with a relevant contribution to the patient's care or management decisions. Tasks are assigned on a weekly basis to specified appointments across the structure of the Defence Medical Services (DMS) and subsequent minutes record

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the progress for each issue. Director of Medical Policy in Surgeon General's Department (SGD) is the Surgeon General's nominated focal point to co-ordinate resolution of high priority and/or complex inter-disciplinary or inter-agency issues on a week-by-week basis. Although originally conceived as a means of managing clinical issues, JTCCC has become a forum for wider issues.

The aims of this study were to:

- Quantify the type and nature of issues arising from JTCCC;
- Identify and explain the reasons for recurrent or unresolved issues;
- Use the results as an opportunity for organisational learning.

Methods

An evaluation of all JTCCC weekly minutes from inception on 30 Mar 07 to 05 Jun 08 (n=61) was performed in Jul 08.

All routine clinical feedback such as details of further surgical care or microbiological evidence of wound contamination, was ignored for the purpose of this study. Where clinical feedback on a patient generated controversy or points for discussion such as differing opinions on wound management between deployed clinicians and UK based teams, this was recorded as an issue. Each separate issue was assigned a NATO 'J' category (Table 1) and further sub-divided into clinical and non-clinical domains. An ongoing issue, referred to week after week, was counted as a single issue. Similar issues that recurred on multiple occasions but in relation to different patients/events were counted as separate issues. Some issues were raised for information only, and required no action. Others required action to be taken and were annotated as being resolved in less or more than 3 weeks. Issues still being actively resolved eight weeks after the study period were recorded as "open" issues. The location in the casualty care pathway most affected by the issue was also described. The original intention was to classify each issue using the 7 pillars of clinical governance [2], but this proved impractical for all issues, as many did not easily map.

J1	Personnel/Manning
J2	Medical Intelligence/Security
J3	Operations/Clinical Practice
J4	Infrastructure/Logistics/Medical Equipment
J5	Doctrine/Plans
J6	Communications
J7	Training
J8	Finance

Table 1: *NATO 'J' Categories*

Results

52/61 (85%) of JTCCC teleconferences over the review period had full participation from both HERRICK and TELIC. Technical communication difficulties (weather or concomitant indirect fire attack) and/or the treatment of casualties prevented the full participation of one or both theatres on nine occasions. On three out of these nine occasions communications were still possible with a single individual from the operational theatre experiencing difficulty.

Analysis of the JTCCC minutes revealed 207 issues across the J1 - J8 categories, in both clinical and non-clinical domains (Figure 1). The category and degree of resolution are summarised in Table 2. Issues remaining open as at 25 July 08 are listed at Table 3. Four of these were reclassified as closed (in an unspecified period) on peer review by the authors and Trauma Nurse Co-ordinator RCDM, although resolution was not formally recorded in the minutes. Issues recurring frequently was a common theme (Table 4). Many of the J3 (clinical practice) issues had a J7 (training) component. All training issues were rapidly actioned and there were no J7 issues listed as 'open'. Examples of issues that have been resolved are given in Table 5. Where possible issues were linked to the most relevant part of the medical evacuation chain (Figure 2), but in 59/207 (29%) of cases this was not deemed possible.

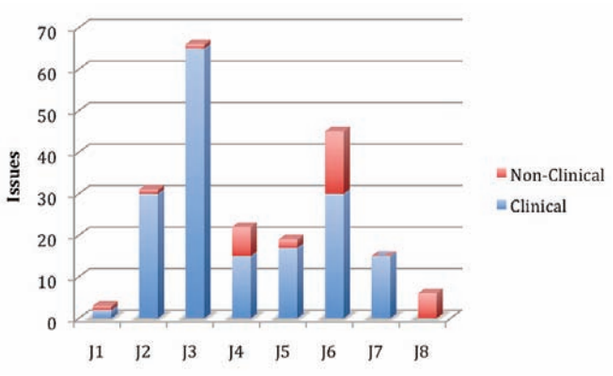

Figure 1: *Clinical and non-clinical issues by 'J' category*

Category	Closed <3 weeks	Closed >3 weeks	Open (unresolved)	Information only	TOTAL
J1	3	0	0	0	3
J2	9	5	1	16	31
J3	36	4	11	15	66
J4	6	4	9	3	22
J5	14	2	1	2	19
J6	30	4	5	6	45
J7	11	0	0	4	15
J8	0	4	1	1	6
TOTAL	**109***	**23**	**28**	**47**	**207**

Table 2: *JTCCC Issues by Category and Degree of Resolution *109/132 (83%) were able to be closed either during the conference by subject matter experts present, or within the following 3 weeks*

Discussion

Clinical Governance

JTCCC has become the focus for governance issues in relation to major trauma and its scope is now beyond the initial intention of simple feedback to clinicians. In civilian practice morbidity and mortality meetings are perceived as effective in reducing future errors [3], and regular multi-disciplinary meetings (MDT) have become a required component of cancer care, and a recommendation in NICE guidelines [4]. By holding weekly meetings and using teleconference technology, the UK Defence Medical Services are ensuring deployed clinical care meets, and exceeds, the standards set in civilian practice. This development is coherent with concerns raised in the 2007 NCEPOD report into trauma care [5], requiring improved governance of trauma, multi-disciplinary communication, and audit of transfers.

		First minuted
J2 Issues		
Clinical	Provision of post-mortem feedback from coalition nations	01.05.08
J3 Issues		
Clinical	Provision of pre-hospital blood products on the MERT (partial resolution as ongoing trial of Golden Hour blood boxes)	28.06.07
Clinical	Battlefield analgesia: requirement for improved capability[1]	27.09.07
Clinical	Post exposure prophylaxis / immunisation policy regarding human tissue contamination (after suicide bomber attack) **[Issue reclassified as CLOSED on peer review]**	05.07.07
Clinical	Clinical feedback to a coalition treatment facility required following initial management of a UK soldier.	01.05.08
Non-clinical	Intra-theatre imaging of deceased (for both EOD and post mortem examination purposes)	28.06.07
Clinical	Incorrect use of CAT tourniquets by non-UK troops. Mechanism of feedback to coalition nation required.	27.09.07
Clinical	Deployment to theatre of vacuum wound dressing therapy	28.02.08
Clinical	Feeding of burns patients in the deployed setting and during CCAST	29.05.08
J4 Issues		
Clinical	Provision of direct digital radiography to both theatres	03.04.08
Clinical	Change of suppliers of pressure transducers means that the new transducers are not compatible with current in-service equipment. **[Issue reclassified as CLOSED on peer review]**	13.12.07
Non-clinical	Properly designed clinical notes folder required for transit of medical records (to help prevent loss of notes/CDs)	10.05.07
Clinical	Lower limb traction equipment required on Op HERRICK	19.07.07
J4 Issues		
Non-clinical	Requirement for a suitable lightweight oxygen cylinder to be approved for front line/aircraft use ASAP.	23.08.07
Clinical	Equipment supply issue: not enough CAT/FFD are being carried by individual soldiers (multiple case reports during JTCCC) **[Issue reclassified as CLOSED on peer review]**	20.09.07
Clinical	FAST1: multiple failures reported *(requirement for incremental change formally propagated)*	24.04.08
Clinical	Asherman Chest Seal: multiple failures reported *(requirement for replacement item formally propagated)*	24.04.08
J5 Issues		
Non-clinical	Forensic evidence: (bullet fragments etc) repeatedly being given to patients instead of the RMP(SIB)	20.09.07
J6 Issues		
Clinical	Frequently mislaid notes at UHBFT	12.04.07
Clinical	No direct, reliable & secure electronic inter-theatre comms for clinicians.	12.04.07
Non-clinical	IT support for deployed TNC (HERRICK) inadequate: individuals reliant on personal laptops *(note: this issue also raised by 3 x successive Clinical Directors Op TELIC 2007-8)*	28.06.07
Non-clinical	Clinical photograph CDs are being routinely handed to individual patients without following release of clinical information policies. **[Issue reclassified as CLOSED on peer review]**	19.07.07
Clinical	Clinical imaging: patients treated outside of the UK chain are not arriving at RCDM with copies of their radiology images	07.02.08
J8 Issues		
Non-clinical	Deployed physicians require a similar feedback system for the non-trauma patients. JTCCC does not have the resources to do this.	06.12.07

Table 3: *JTCCC issues remaining open eight weeks after the period studied. At time of writing all issues had been addressed. [1] This issue has been raised multiple times relating to different incidents. For clarity it is mentioned only once here.*

EOD – Explosive Ordnance Disposal; CAT – Combat Application tourniquet; CCAST – Critical Care Air Support Team; FFD – First Field Dressing; RMP(SIB) – Royal Military Police (Special Investigation Branch); UHBFT – University Hospitals Birmingham Foundation Trust;

The concept of clinical governance has evolved since the inception of the NHS and is focused around achieving continuous quality improvement. Clinical governance has been formally defined as a framework of accountability for continually improving the quality of services [6]. Furthermore it is "*…a chance to harness and value the talents and skills of staff – to recognise the need to mobilise knowledge from the front line.*" [2]. By these definitions JTCCC is clearly a clinical governance tool, but assessing its effectiveness may be difficult. The NHS Clinical Governance Support Team use a temple model to capture the components necessary for successful clinical governance. There are seven "pillars" underpinned by five cultural components – the solid foundations needed to establish an enabling culture (Figure 3).

In Table 6 a selection of issues identified by JTCCC are mapped to the most relevant clinical governance pillar(s) to illustrate its scope as a clinical governance tool; all seven pillars are represented. The five foundations of clinical governance: systems awareness, teamwork, communication, ownership and leadership accurately describe what JTCCC achieves.

Our data (Figure 2) suggests JTCCC is most effective in identifying issues encountered from arrival at the field hospital (Role 2 Enhanced/Role 3) onwards. This is understandable as the complete scope of governance issues encountered in the pre-

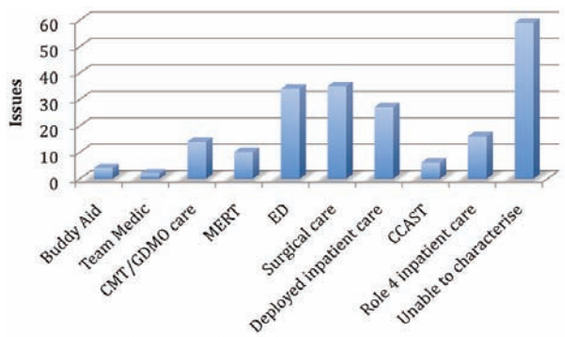

Figure 2: *Issues by location in the casualty care pathway.*

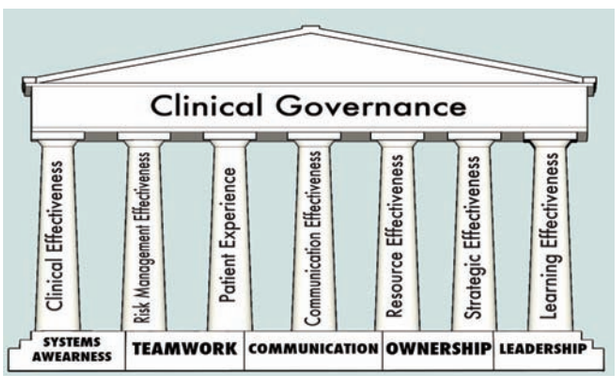

Figure 3: *The temple paradigm*
credit: drawn by LM Ibbetson after concepts published in [2]

J2 Issues	
Clinical	Deployed clinicians seem unaware of the importance of the **trauma audit process** and the necessity to provide good quality information to the audit process
J3 Issues	
Clinical	**Hypothermia mitigation.** Awareness amongst deployed clinicians about the prevalence of hypothermia in trauma patients, the importance of preventing it and the current equipment available in theatre.
Clinical	**Intra-osseous devices.** Numerous issues relating to correct use (training), and failures of FAST1.
Clinical	JTCCC used as a forum to raise awareness amongst deployed clinicians of **recent clinical trends** identified (e.g. occult spinal injury, calcaneum # in UBIED, Oestrus ovis eye infestations)
Clinical	Surgical technique guidance (e.g. the use of guillotine amputations, stapling dressings into wounds).
Clinical	Important clinical governance issues (e.g. intraosseous needles in the deceased posing a needlestick threat to mortuary staff).
J4 Issues	
Non-clinical	Deployed clinicians seem unaware how to staff the requirement for **new or improved equipment.** JTCCC is used to guide deployed clinicians through this process (i.e. gather evidence then write USUR/SOR and send through command chain via Comd Med)
J5 Issues	
Clinical	**Massive transfusion** Surgeon General's Policy Letter. Evidence that deployed clinicians are not fully aware of this policy.
Clinical	Questions are sometimes raised by deployed clinicians that can be answered by referring to ***Clinical Guidelines for Operations*** (JDP 4-03.1) of which not all clinical staff are aware.
J6 Issues	
Clinical	Issues surrounding **clinical photography and consent** are the most frequently recurring issues discussed at JTCCC (e.g. mobile phone video of poor surgical practice given to patient; wound photos failing to reach RCDM with patient)
Clinical	Deployed clinicians are frequently **contacting NHS consultants outside of RCDM** for advice and referral. Both unfamiliarity with the correct procedures and technical difficulties speaking to the correct specialist at RCDM are cited as reasons.

Table 4: *Frequently recurring issues*

J1 Issues	
<3 weeks	Failure of deployed consultant to liaise with RCDM resulting in patient returned to hospital in Leicester
<3 weeks	Nil
J2 Issues	
<3 weeks	New injury pattern: progressive muscle necrosis attributed to *Aeromonas* spp infection
<3 weeks	Requirement for understanding if shelf-life of defrosted plasma can be extended
J3 Issues	
<3 weeks	Potentially unnecessary limb amputation: clinical justification required
<3 weeks	Risk of needlestick injury for mortuary staff when intraosseous needles inadequately secured in repatriated bodies
<3 weeks	Best practice advice from Consultant Adviser regarding traumatic eye injury
<3 weeks	Requirement for all fresh whole blood from non-UK donors to be clearly documented
<3 weeks	Surgical practice advice: partial vs complete fasciotomies
>3 weeks	Care pathway documentation trial
J4 Issues	
>3 weeks	EZ-IO® adult intraosseous equipment not in both theatres
>3 weeks	Delays in off-loading platelets from aircraft leading to product wastage
>3 weeks	Provision of hypothermia mitigation equipment

Table 5: *Examples of Closed Issues*

J2 Issues		**Pillar(s)**
Clinical	Provision of post-mortem feedback	Communication effectiveness Learning effectiveness
J3 Issues		
Clinical	Provision of pre-hospital blood products on the MERT	Clinical effectiveness Strategic effectiveness
Clinical	Battlefield analgesia: requirement for improved capability	Patient experience
Clinical	Intraosseous needles in the deceased posing a needlestick threat to mortuary staff	Risk management effectiveness
J4 Issues		
Non-clinical	Delays in off-loading platelets from aircraft leading to product wastage	Resource effectiveness
Clinical	Asherman Chest Seal: multiple failures reported *(requirement for replacement item formally propagated)*	Resource effectiveness
J5 Issues		
Clinical	Thromboprophylaxis policy not being adhered to	Learning effectiveness Risk management effectiveness
J6 Issues		
Clinical	Clinical imaging: patients treated outside of the UK chain are not arriving at RCDM with copies of their radiology images	Communication effectiveness
J7 Issues		
Clinical	CMT triage errors: use of morphine falsely implying T1	Learning effectiveness
J8 Issues		
Non-clinical	Deployed physicians require a similar feedback system for the non-trauma patients. JTCCC does not have the resources to do this.	Strategic Effectiveness

Table 6: *JTCCC issues mapped to clinical governance pillars*

J5 Issues	
>3 weeks	Thromboprophylaxis policy not being adhered to
>3 weeks	Policy for pre-transfer CT with ocular injuries
>3 weeks	mTBI in-theatre management vs US practice
J6 Issues	
>3 weeks	Policy for UHBFT Switchboard handling consultant enquiries from deployed hospitals
>3 weeks	Policy for UHBFT to access CT images from deployed hospital posted by Royal Hospital Haslar on internet
>3 weeks	Secure telephone communications requirement for ADMEM RCDM
J7 Issues	
>3 weeks	FAST1: incomplete training
>3 weeks	Tourniquet applied inappropriately over full trouser pocket
>3 weeks	CMT triage errors: use of morphine falsely implying T1
>3 weeks	Reiteration of requirement to use 4-point pain scale at all echelons
>3 weeks	Nil
J8 Issues	
>3 weeks	Nil
>3 weeks	Requirement for enhanced trauma audit resources at RCDM

hospital environment is not covered by this forum. A weekly joint governance meeting was started in August 2009, chaired by the Medical Director of the UK Field Hospital and involving United States (US) and UK Medical Emergency Response Team (MERT) primary retrieval practitioners, together with hospital clinicians and the tasking authority (Joint Helicopter Force). The standing agenda includes a tactical briefing; review of all pre-hospital and early hospital deaths; a longitudinal mission analysis (alternating between US and UK each week) and transverse audit of a specific aspect of care. Topics have included triage accuracy, use of pre-hospital blood products, airway interventions, and compliance with MIST message. This initiative is the culmination of three months of groundwork by the deployed TNCs to build the relationships between the multi-national pre-hospital providers.

Clinical governance issues identified at post mortem carry particular sensitivity. The information is privileged and *sub judice* as it precedes the investigation required for the Coroner's Inquest, but is included with the Coroner's permission. Feedback is strictly controlled to the responsible deployed clinicians. Where necessary to improve future clinical care, detailed feedback can be provided via secure telephone systems. Since October 2008, minutes have been produced in both "clinical" and "non-clinical" formats with clinical case feedback restricted to clinical addressees in the distribution list.

Individual and Organisational Learning

JTCCC provides clinical feedback on repatriated Service personnel who have been treated in UK field hospitals. This includes coalition forces evacuated to UK for definitive care - injured foreign national soldiers from some partner nations are evacuated to the Royal Centre for Defence Medicine by prior agreement. Feedback is limited to two weeks from the date of injury unless an unexpected event occurs. The process is primarily targeted at supporting deployed clinicians, whose previous combat trauma experience may be limited: trends of recurring issues can therefore be expected. The authors' personal experience from working both at Role 4 and in the deployed environment, is that deployed clinicians highly value the feedback they receive on 'their' patients.

Individual pre-deployment learning from current issues is encouraged by distribution of minutes to Defence Consultant Advisers, medical unit commanders warned for deployment (6 months prior to deployment) and to 2 Medical Brigade, for incorporation of contemporary issues into field hospital collective training programmes. The flexibility to adapt existing individual training systems (First Aid, Army Team Medic, *Battlefield Advanced Trauma Life Support)* and collective training (Box 1) is evident from the speed with which all training issues are addressed; all J7 issues were actioned in under 3 weeks and none remained unresolved at the end of the study period.

HOSPEX	Clinical staff in a simulated field hospital
OPTAG	Military situational awareness training pre-deployement
RSOI	Military situation awareness training on arrival in theatre

Box 1. *Military collective training*

Anarchy or release valve?

JTCCC has been criticised as potentially circumventing the command chain. In fact, the opposite is true. Previous informal mechanisms of obtaining clinical advice such as telephone calls and emails to colleagues in UK are now channelled through JTCCC and deployed clinicians are advised on how to correctly submit formal requests for capability enhancement (eg a perceived new equipment requirement). The command chain is exposed to the issue in advance through JTCCC and is sensitised to its importance prior to routine administrative procedures being followed: where the issue is of particular importance further information can be actively pulled through the command chain. This matters as the many bureaucratic filters in a chain of command can present opportunity for the process to stall. The involvement of PJHQ in JTCCC mitigates against any failure in this process. JTCCC has empowered clinicians with a single mechanism to communicate all performance improvement issues that relate to combat casualty care with the expectation that these will be visible to, and rapid resolution will be stimulated by, the higher echelons of the DMS.

Areas of Weakness

There are two principal weaknesses of JTCCC. First is that feedback is largely restricted to care of UK Service personnel repatriated to University Hospitals Birmingham. This accounts for only half of the in-patient combat casualty care activity within the deployed field hospitals: the remainder are audited retrospectively, but feedback is not dynamic or related real-time to the patient's treatment. The second weakness is the limited ability to provide feedback to non-UK medical treatment facilities involved in treating UK Service personnel. Clinical governance issues have been identified where UK best practice has not been followed. Feedback has to overcome both communication system incompatibilities as well as political sensitivities. Developments in deployed clinical governance, endorsed by a NATO strategic approach to clinical governance, will improve the ability to develop international clinical governance processes.

The US military also conduct a telephone conference linking the deployed hospitals with Lundstuhl and Continental USA. The US Veterans' association use a telephone conference approach to co-ordinate clinical and welfare services for polytrauma patients [7]. A Medline search looking for other examples of telephone conferencing similar to JTCCC found only material relating to telephone triage, patient follow up and counselling, making the inception of the JTCCC unique.

Conclusions

JTCCC has become more than a clinical feedback tool. Useful lessons and potential issues are quickly identified and both the chain of command and those preparing to deploy can learn from them. It augments other trauma governance tools and is one of our main assets in monitoring our progressively improving outcomes in the care of the combat trauma casualty. It remains limited in currently preventing inclusion of non-UK casualties and non-UK treatment facilities and by the limited input of pre-hospital care providers to the process.

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