

Focus On....Managing Health Services Support to Military Operations.

Tactical Aeromedical Evacuation (TACEVAC)

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Abstract

This is the fifth in a series of monographs that examine some of the principles and factors involved in managing health services support to military operations. This paper will discuss the principles of tactical aeromedical evacuation (TACEVAC) planning and execution with specific consideration of the command and control arrangements for TACEVAC. UK personnel may be familiar with TACEVAC procedures using UK national aircraft and aeromedical evacuation crews between national medical facilities. Recent operations, most particularly in Afghanistan, have illustrated the requirement to understand TACEVAC within a multi-national context as both our military hospitals have moved patients using other nations aircraft and medical escort crews, and UK aeromedical aircraft and crews have moved other nations' patients. The next paper will consider Deployed Hospital Care and the innovations over the past decade in clinical capabilities to care for casualties within the theatre of operations.

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'right patient, right time, right platform, right escort, right destination'

Introduction

This is the fifth in a series of monographs that examine some of the principles and factors involved in managing health services support to military operations. The previous paper considered aeromedical evacuation from point of injury to first level of hospital care. This paper will consider the medical evacuation of patients between medical facilities within a theatre of operations; tactical aeromedical evacuation (TACEVAC). It will discuss planning and execution with specific consideration of the command and control arrangements for TACEVAC. UK personnel may be familiar with TACEVAC procedures using UK national aircraft and aeromedical evacuation crews between national medical facilities. Recent operations, most particularly in Afghanistan, have illustrated the requirement to understand TACEVAC within a multi-national context as both our military hospitals have moved patients using other nations aircraft and medical escort crews, and UK aeromedical aircraft and crews have moved other nations' patients. The next paper will consider Deployed Hospital Care and the innovations over the past decade in clinical capabilities to care for casualties within the theatre of operations.

Medical Evacuation Definitions and Resources

The movement of patients by air has been an important component of military medical health systems for nearly 100 years. With the advent of passenger and cargo planes, patients have been regularly moved by fixed wing aeroplanes (FW) within theatres of operations and from theatres of operations back to the home base. TACEVAC was an essential method for moving patients long distances during World War 2 (1). During the Falklands War in 1982 the UK used hospital ships to TACEVAC from the South Atlantic and established a STRATEVAC route from Montevideo. For Op GRANBY in 1991, the UK set up a TACEVAC loop between

deployed hospitals in the Gulf, and STRATEVAC back to UK via Cyprus (2). TACEVAC loops were established to move patients during Ex SAIF SERREA in OMAN in 2001 (3), for the early stages of OP TELIC in 2003 and are essential for the ISAF mission in Afghanistan (4).

NATO medical doctrine defines a number of medical evacuation terms (5). The previous paper in this series examined Forward Aeromedical Evacuation (FAME or commonly MEDEVAC) which provides for transfer from the point of wounding to the initial medical treatment facility. Tactical Aeromedical Evacuation (TACEVAC) is the medical movement of casualties within the Joint Operational Area (JOA) between MTFs. Strategic Aeromedical Evacuation (STRATEVAC) is the evacuation of casualties from the JOA, to the home nation, to other NATO countries or to a temporary out of theatre safe area. Strategic MEDEVAC is primarily a national responsibility. It should be noted that not all NATO nations utilize these definitions. This paper will not consider MEDEVAC nor STRATEVAC.

Whilst TACEVAC may be conducted by road, rail, or sea, in recent operations it is almost invariably done by either Rotary Wing (RW, helicopter) or Fixed Wing (FW) aircraft depending upon distance and speed of response required. TACEVAC is arguably the most complex phase of aeromedical evacuation (AE) requiring coordination at many levels. The mantra 'right patient, right time, right platform, right escort, right destination' describes the multiple components of the patient movement. Whilst MEDEVAC tends to have RW lead and STRATEVAC has FW lead, TACEVAC requires close integration between clinical advisors and proponents of both types of airframe.

Command, Control and Co-ordination (C3).

As described in the previous paper, NATO doctrine directs that medical evacuation is controlled by a Patient Evacuation Co-ordination Centre (PECC). The PECC may need to be

separated into two sub-functions, the MEDEVAC Operations cell (MEDEVAC Ops) providing C3 to MEDEVAC and the Evacuation Co-ordination Cell, managed by the Evacuation Co-ordination Officer (ECO) providing C3 to TACEVAC. TRAC2ES (the US system) and other national systems for managing TACEVAC must be visible to the theatre chain of command, either by providing liaison officers or by providing national electronic information systems and login details to ECOs in HQ appointments. This ensures that bed management, patient regulation and transfer from airfield to Medical Treatment Facilities (MTFs) are properly co-ordinated.

TACEVAC planning should consider both RW and FW capabilities. RW tends to be more responsive because control is usually delegated to tactical commanders. It is usually of smaller capacity and shorter range. FW TACEVAC usually has higher volume and established mechanisms for patient escort but is more complex to organise because of the requirement to co-ordinate across service component boundaries and also across layers in the chain of command. Most current systems are based on re-allocating RW or FW aircraft from other transport tasks. An important aspect of medical planning is to determine whether this 'in system select' system is sufficient or whether it is more efficient to run a scheduled, dedicated aeromedical evacuation service that allows hospitals to hold patients confident in the programme for TACEVAC. The current system also involves validation (clinical approval of the PMR) from a HQ separate from the sending MTF. This is satisfactory for a low volume system but may need to change for a scheduled system as the confirmation of the scheduled TACEVAC manifest should be done as late as possible. This might require delegation of PMR validation to the emplaning medical team. The final element of the TACEVAC plan is to consider the whole patient population and determine how emplaning rules should be adjusted for multi-national forces, indigenous security forces and local civilians.

The ECO function requires an understanding of all aspects of the 'right patient, right time, right platform, right escort, right destination' concept. The ECO should have sufficient

clinical knowledge to understand the implications of clinical details entered into the PMR in the assessment of time, escort and destination for the patient. They also require sufficient operational understanding to match the airframe to the clinical requirement. This will normally require a SNCO or officer with previous aeromedical evacuation training.

The correct selection of TACEVAC capability by the originating MTF is the key to successful TACEVAC. This requires a clearly designated Hospital Evacuation Co-ordination Officer who acts as the interface between the referring clinician, the hospital clinical director, the hospital commanding officer and the RC. The person(s) filling this function must understand all of the TACEVAC capabilities (including ground) available to support the clinical requirement. They may be supported by Subject Matter Experts (SMEs) for each specific type of AE capabilities but practical experience has shown that SMEs do not replace the generic function unless they have been given this specific task.

Right Patient

The TACEVAC requesting process mirrors the civilian practice protocol of formal referral from the attending clinician in the donor facility to a nominated clinician in the receiving facility. A TACEVAC mission is initiated by a 'doc to doc' discussion between the sending and receiving MTF. Once the transfer has been agreed a Patient Movement Request (PMR) is completed by the sending MTF. The PMR is a comprehensive summary of the medical condition of the patient. The PMR allows confirmation of clinical details between hospitals and also to enable validation by the medical emplaning authority. The ECO's role is the detailed co-ordination of all aspects of the patient's movement including confirming agreement to the TACEVAC by all authorities, ground ambulance transport to and from the aircraft and collating PMRs into aircraft manifests.

Right Time

For planning purposes, the speed at which casualties flow through the AE system is informed by 'medical planning timelines'. Building on the foundation of existing doctrine, evidence from accumulated experience and that published in peer review literature, the medical planning timelines for MEDEVAC have been changed to the 10-1-2 Guidelines. This advocates ten minutes to airway and bleeding control, one hour to be reached by MEDEVAC with skilled first aid and 2 hours to surgery. However, previous NATO 'clinical timelines' discuss reaching Damage Control Surgery (DCS) by 2 hours and Primary Surgery by 4 hours. The requirement for the casualty to reach primary surgery within 4 hours needs to be revalidated in order to set the minimum time requirement for TACEVAC. This is especially important for transfers from R2 to R3 for specialist care such as neurosurgery and ophthalmic surgery. It is suggested that TACEVAC timelines should be 2 (Urgent), 4 (Priority) and 24 (Routine) hours. These clinical timelines need to be balanced with operational constraints, especially when considering TACEVAC for specialist care such as neurosurgery or ophthalmology if the size of the population at risk does not justify deployment of the specialist teams.

Whilst TACEVAC should be driven by clinical requirements, there may also be an operational requirement to move patients in order to clear beds in the sending MTF. This needs to be included in the PMR process in order for the MTF commander or controlling HQ MEDDir to request TACEVAC for a 'bed clearing' mission.

Right Escort

The medical escort must always match the clinical need of the patient to prevent deterioration en route. The confirmation of the patient's suitability to fly and the assignment of a medical escort is termed 'validation'. The medical escort requirement should be discussed during the

‘doc to doc’ discussion and entered on the PMR. The tasking authority for TACEVAC is responsible for validation and this should be done by a aeromedically trained clinician. The level of care can be adjusted from the highest level of a doctor led intensive care team (UK Critical Care Air Support Team/US Critical Care Air Transport Team) down to a flight medic for routine patients. The use of CCAST/CCATT is not always possible on all types of aircraft because of the requirement for medical equipment to be tested for airworthiness on each specific aircraft. A number of local solutions have been developed. The US Army is deploying specially trained ICU nurses to Afghanistan to provide additional personnel for the TACEVAC escort task. The exact methodology for their employment is currently being developed. The intra-regional movement of ambulatory ‘Routine’ patients should be carried out by regular ‘round robin’ RW routes with allocated medical escorts on board to collect these patients rather than utilize MEDEVAC aircraft. This will therefore not denude capability for routine moves and allow for better planning as it will provide a regular outlet for facilities.

Right Platform

There may be multiple types of TACEVAC aircraft available in an operational mission. As an example, there are potentially 4 types of RW and 4 types of FW available for aeromedical evacuation from the UK hospital at Camp BASTION in Afghanistan. RW TACEVAC is usually controlled at the HQ level using helicopters assigned to the MEDEVAC mission. Often for urgent intra-regional moves, RW is the platform of choice as it can be quickly tasked and may be the only option if the MTF does not have an adjacent airstrip. This can result in the MEDEVAC ‘range ring’ being uncovered unless there is more than one assigned MEDEVAC taskline. This can be done as either a TACEVAC push or TACEVAC pull/patient retrieval mission. The table 1 shows the comparison between the two.

Table 1 Comparison between TACEVAC ‘push’ and TACEVAC ‘pull’/patient retrieval

TACEVAC 'push'	TACEVAC 'pull'/patient retrieval
<ul style="list-style-type: none"> • Moves from Role 1 'upward' • Degrades MEDEVAC laydown • Take in-flight team from holding facility • In-flight capability fixed by availability • Holding facilities capability reduced • Handover to in-transit care and receiving team • Requires re-set for staff • Quicker 	<ul style="list-style-type: none"> • Collect from 'downward' • Maintains MEDEVAC laydown • Takes in-flight team from receiving facility • In-flight capability tailored to mission • Receiving facility capacity reduced • Handover from current care team • No re-set for staff • Slower

Expanding on the C3 for TACEVAC, there are at least 3 FW TACEVAC options in ISAF, illustrating the complexity of FW TACEVAC tasking and the need for all Hospital Evacuation co-ordination Officers and ECOs to understand the whole system:

- As per UK doctrine AP 3394, the UK has a Tactical Aeromedical Evacuation Command Centre (Tac AECC) within the UK national Joint Force Support (Afghanistan) HQ. The Aeromedical Ops Officer (AEOO) requests UK RW or C130 assets within theatre and tasks UK aeromedical escort teams. The UK Aeromedical Evacuation Coordination Officer (AECO) validates all patient moves. This system provides delegated in-theatre authority for UK TACEVAC. It is quick and efficient and has been the method of choice for TACEVAC from the UK R3 at Camp Bastion as it can use either FW or RW.
- The main USAF TACEVAC system requires the use of the CIS system called TRAC2ES and only has access to FW assets. The authority for TACEVAC

to come from the Coalition Air Operations Centre (CAOC) within which is the Joint Patient Medical Regulation Cell (JPMRC – validation authority) and the Aeromedical Evacuation Control Team (AECT – aircraft and escort tasking authority). This method was designed to support STRATEVAC and has not been as quick as the UK system to authorize and validate Afghan patients for TACEVAC.

- The USAF have also deployed 2 HC130 aircraft (callsign Fever) in the personnel recovery mission that are available for TACEVAC. These should be requested by an ISAF PMR to the RC and are tasked by a ‘9 liner’. The precise mechanism for validation of the patient and medical escort is not defined. Finally there is a DEU C160 assigned to the TACEVAC mission that is requested via a PMR to IJC but controlled by DEU national authority in HQ RC(N).

Right Destination

The theatre hospital laydown must ensure that R3 MTFs with specialist care are matched to the clinical demand and medical planning timelines in order to ensure patients can be moved by TACEVAC in time to meet their clinical need. The movement of casualties to the right MTF depends not only on the injuries sustained by the casualty but also the type of casualty. Whilst the Medical Rules of Eligibility (MRE) apply for the entry of all casualties in the ISAF AO, doctrinally only NATO/PfP troops are discussed in the AE chain. In the ISAF operation the goal is for an ‘Afghan to treat an Afghan’ but unfortunately the limitations of Afghan medical capabilities may require the entry of Afghans into the ISAF medical system. The challenges associated with the three non-ISAF populations are discussed below:

- **ANSF.** As part of the COIN strategy, ANSF are seen as part of the coalition and thus are entitled to ISAF medical support within MRE. After initial treatment they should be transferred to an ANA regional hospital or to the ANA national hospital in Kabul. The Afghan National Air Force (ANAF) should have primary responsibility for moving ANSF casualties around theatre. Currently the in-flight care capability is very limited and the tasking mechanism does not allow for the urgent of move of patients. There is scope to develop the ANSF to have an ASU/CSU basic facility in order to give them the time to coordinate an ANAF TACEVAC move from ANSF to ANSF facilities. The movement of these casualties via TACEVAC is as complex as any other ISAF move. HQ IJC will be forming a workgroup to draw together ISAF activities in support of ANSF TACEVAC.

There are two key issues:

- **Bed Regulation by ANSF.** This is currently a problem in that, whilst ANSF facilities are not controlled by ISAF, the movement of ANSF from one facility to another is vital in ensuring that ANSF facilities have bed capacity available to take ANSF casualties. The ANA Kandahar Regional Military Hospital (KRMH) is the ANSF receiving hospital in the South of Afghanistan. It is regularly RED or BLACK for ICU. It is essential that ANSF casualties can be easily cleared from the South in order to maintain hospital capacity. The ANSF should be partnered and mentored to regulate their own forces. ISAF needs also to be able to offer ISAF TACEVAC assistance to enable bed clearance from ANSF MTFs.
- **Acceptance from Regional to National Hospitals.** There are a number of patients who require long-term care who should be moved from ISAF MTFs direct to the National Military Hospital (NMH) in Kabul to avoid a transitory stay in KRMH. The acceptance of these patients is often refused, for a number of reasons such as difficulty with ambulances or that KAIA R3 is unable to be the

fall back plan should NMH be unable to take the patient once they have arrived at KAIA. IJC should engage at every level to push the acceptance of ANSF patients or ISAF facilities will continue to have nowhere to move their ANSF casualties or be required to take on more.

- **Local National Civilians (LN).** LN that fall within the MRE are accepted into ISAF MTFs. Similar to ANSF there are limited options for these patients to be moved on after their initial treatment. Every MTF should have an outlet into the LN healthcare system for various types of patients based on transfer to the Afghan hospital closest to the patient's home consistent with the patient's clinical need. RCs and IJC need to have a robust reference system to track Afghan civilian capabilities in order to facilitate TACEVAC and acceptance of Afghan patients who have clinical needs that cannot be met at a local level.
- **Detainees.** This population have the longest Length of Stay within an ISAF MTFs. NATO doctrine makes it clear that detainees are the responsibility of the capturing Nation, however they may require specialist care at another MTF which may not be the capturing Nations facility. There is a clear need for theatre level policy on the management of detainees with on-going clinical requirements after emergency medical care.

GOVERNANCE ISSUES AND LESSONS LEARNED

NATO and TCNs have established governance arrangements for MEDEVAC including monitoring of MEDEVAC mission times. This needs to be replicated for TACEVAC with greater emphasis on clinical outcomes rather than time. Adverse outcomes from TACEVAC missions should be highlighted by a MEDINCREP and reviewed under the authority of the

RC MEDDir. This should be included within the Continuous Improvement in Healthcare Support to Operations (CIHSO) process.

SUMMARY

This summarises the key elements of a deployed military TACEVAC system structured around the mantra for ‘intelligent tasking’ of ‘right patient, right time, right platform, right escort, right destination’.

Word count: 00

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