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Firebase medicine: extending the Role I aid station

Ramey L Wilson,[1,2] A G Truesdell[3]

ABSTRACT

The unique nature of counterinsurgency warfare in Afghanistan highlights the tactical and technical challenges of the non-contiguous battlefield. Although remote military outposts distant from their support hubs help project NATO power, they also operate without the advantages of a secure rear area or interior lines of communication. Commonly referred to as 'firebases', these outposts typically house a platoon or company-sized element and present numerous challenges to the delivery of medical care and support. Medical planners and providers can mitigate many of these inherent risks through targeted interventions designed to increase the capabilities of these remote outposts. These interventions include focused higher-level trauma and non-trauma medical training for both medical and non-medical personnel, expanded equipment lists, ongoing medical education, training and rehearsals, and a proven and redundant communications plan.

INTRODUCTION

We ask a great deal of our combat medics. Despite relatively little training, they are typically the first to respond, assess, stabilise and treat most combat casualties. Medics deliver life-altering and commonly lifesaving care with poise and skill, often under fire. Their efforts have led directly to significant increases in the survivability of modern combat wounds.[1] Equally important, medics' trauma skills, refined through ongoing advances in training and doctrine accompanying the evolution of the Tactical Combat Casualty Care programme (TCCC), embolden US forces for aggressive action; if injured, soldiers are confident that their medics will provide timely and effective on-scene medical interventions and evacuation for definitive care. What platoon would embark on a mission without their medic?

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Current tactics and techniques of counterinsurgency warfare in Afghanistan emphasise the challenges posed by the non-contiguous battlefield.[2] Remote, isolated military outposts project military power but operate without the advantages of a secure rear area and present unique medical challenges.[3 4] Commonly referred to as 'firebases', these outposts are typically occupied by a platoon or company-sized force (30–130 soldiers). In the absence of reserve assets or nearby friendly forces, threat assessment and planning become paramount—particularly when employing individual medics at remote sites without direct medical supervision. Based on our experiences in Afghanistan in 2007 and 2008 while serving as Battalion (RLW) and Brigade Surgeons (AGT), respectively, responsible for the delivery of tactical health services, we recommend several targeted interventions to mitigate the medical threats posed by firebases: focused higher-level trauma and non-trauma medical training for both medical and non-medical personnel; expanded equipment lists; ongoing medical education, training and rehearsals; and a proven and redundant communications plan. This article discusses our approach to firebase medical support by highlighting two separate medical incidents: the grave wounding of a coalition soldier soon after our arrival, and the care provided to an enemy combatant following subsequent refinements to the medical support plan.

FIREBASE MEDICINE: A NON-DOCTRINAL MISSION

Medical support to firebases is not specifically addressed in current military doctrine, and the remoteness of firebases complicates attempts to provide full-spectrum health support.[5] The standards of evacuation, however, remain unchanged: all 'urgent' patients, for example, must arrive at locations with surgical capability within the 'golden' hour.[6]

The typical infantry battalion employs two credentialed providers (a physician and a physician assistant), a medical administrative/planning officer and 24 medics and provides care for 500–1000 soldiers. This medical team is responsible for all Role I medical care for the entire battalion across the battlespace.[7] One medic is allocated to each infantry platoon (50–60 soldiers); when platoons operate independently or remotely, the medic is the only on-hand medical resource. Regardless of a medic's level of training or experience, he or she is the point man for the platoon's healthcare needs: trauma care, primary care, physical therapy and mental health.

New combat medics arrive at their first duty station with the medical skills accumulated during 16 weeks of medical training at Fort Sam Houston, Texas, USA. This training primarily teaches medics how best to care for combat casualties in hostile, pre-hospital environments. Based on current principles of TCCC and pre-hospital trauma life support, medic training hinges on the ability to transport patients to higher echelons for more definitive care. In our current wars, medics face demands outside their training focus—and perform tasks beyond initial trauma care.

Ongoing analysis of real combat operations since 2001 highlighted the need for expanded trauma and non-trauma training for medics.[8–11] Training has been adjusted accordingly, with the addition of an additional week of non-trauma clinical care during initial medic training. Still, despite a 3-week integrative skills-assessment field exercise with simulated casualties, at no time during a medic's initial training does he or she care for actual patients.[12–14] As a result, non-trauma skills such as the evaluation and treatment of musculoskeletal injuries, common infections and dermatological problems are rudimentary. These subjects are not taught at a level to permit a medic to evaluate and treat patients without direct supervision, such as that which occurs on a firebase.[15]

Additional ad hoc unit-based medical training following initial instruction at Fort Sam Houston is often rare. Infantry battalions do not have physicians in garrison, and the battalion physician assistant usually works in an off-site clinic away from the medics. Because medics are needed to support daily training and also subject to multiple non-medical taskings, they rarely have the opportunity to participate in training beyond the minimum necessary to maintain certification. These knowledge and experience deficits manifest when medics deploy to remote locations in a non-doctrinal manner. This disparity between mission requirements and troop capabilities creates both medical and tactical risk.

MISSION ANALYSIS

Following initial combat operations in Afghanistan in 2001–2002, most units

conducted relief-in-place operations; inbound units deployed their forces according to the posture of departing units. While planning for a deployment in Eastern Afghanistan in 2007, our battalion's area of operation was altered 2 weeks prior to the deployment due to a decision to double infantry forces in eastern Afghanistan. Unfortunately, the doubling of combat forces was not met by any increase in area medical, surgical or evacuation assets. On arrival, our battalion was tasked to assume responsibility for a province the size of Wales. The updated mission also called for supporting additional firebases without additional organic medical personnel. The medical platoon's challenge was to provide point-of-injury care for all traumatic injuries, deliver routine medical care to a 1000-person coalition force and partner with local health ministries to facilitate targeted health sector development across a vast mountainous region with minimal ground access and unpredictable air access. Further complicating matters, the platoon packed their medical equipment, shipped by sea to the original area of responsibility, prior to the change in the mission. Once in Afghanistan, unloading, repacking, and transporting personnel and equipment to the new areas took several weeks. Fortunately, medics intentionally hand-carried aid bags and initial treatment equipment during their movement into Afghanistan, allowing them to deliver essential care immediately. During this transition period, the unit sustained its first casualty.

CASUALTY CARE ON ARRIVAL

On a cold evening in February 2007 in a volatile district in eastern Afghanistan, an explosion rocked a guard tower on a platoon-sized firebase. The soldier manning the tower was discovered on the ground unconscious, and the platoon medic, the sole medical asset on the small firebase, quickly evaluated the patient. The patient had an altered level of consciousness and presented with dyspnoea. During examination, the medic noted unequal rise and fall of the patient's chest. While the medic was preparing to intervene, the patient lost consciousness. Acting promptly, the medic performed needle decompression for a suspected pneumothorax. The patient regained consciousness and his breathing normalised. A 9-line Medical Evacuation (MEDEVAC) request was denied due to severe weather conditions and soon after communication with higher headquarters was lost. The patient was loaded into the back of an up-armoured truck—the only armoured platform then available in Afghanistan—and driven to the battalion aid station over unlit, unimproved roads known to be littered with improvised explosive devices. The 30-mile trip took 3 h. In the confined space of the vehicle, en route care was limited to monitoring consciousness and pulse oximetry. As the small convoy departed the firebase with the casualty and the platoon's lone medic, the firebase lost all on-site medical support for the remaining 24 soldiers.

This event highlighted several weaknesses of the original medical support plan. In response, four refinements were implemented: innovative medical training, personnel augmentation, equipment improvements and an enhanced communications plan.

Training initiatives

Prior to deployment, the initial mission analysis called for the medical platoon to provide support in a non-doctrinal manner by dividing among four bases. The physician and physician assistant were to be positioned at the two locations with the greatest risk of casualties, and the two most experienced medics would supervise the other two bases. Recognising the risks inherent in this model, the platoon underwent aggressive pre-deployment medical training. All medics underwent a 5-day long tailored TCCC course, primarily focused on the recognition and treatment of traumatic injuries with additional modules covering infectious disease, dermatology and health development. Training culminated in a final field exercise which included simulated patients. Each medic received hands-on live training and testing on basic and advanced trauma skills, which included: airway management with endotracheal intubation and surgical airways, needle chest decompression and tube thoracostomy, intravenous access including intraosseus access and venous cut down, burn and blast injury management, and haemorrhage control with pressure, tourniquets, and haemostatic bandages. All other members of the battalion received a multiday curriculum of medical instruction modelled on the combat lifesaver course.

The battalion surgeon was assigned to the unit 1 month prior to deployment and began daily lectures and hands-on training classes on non-trauma care: daily sick call, pharmacy and preventive medicine. Together with the assigned physician assistant, he heavily involved himself in the final planning for medical support on the battlefield. The two senior medics who were planning to man the smaller bases rotated to the local clinic to improve their non-trauma skills.

With the sudden change in mission, the additional training conducted prior to deployment proved its value. In addition, future steps were taken to sustain medical skills in theatre through reinforcement and validation testing of medic skills. Common medical scenarios were extensively rehearsed, and senior battalion and brigade medical providers were rotated through the remote bases on a routine basis to verify training and provide additional medical support. When possible, line medics were rotated back through larger bases for additional instruction and training. Finally, a mobile training team rotated throughout the major forward operating bases to provide refresher training for all medics halfway through the 15-month deployment and validated skill competency using standardised injuries on a manikin model.

Personnel augmentation

While deploying to Afghanistan with a full complement of medics, the non-doctrinal employment of our combat forces required a non-doctrinal approach to health support. As the only medical assets in the area, the infantry medical platoon also provided medical coverage to nearby or co-located units. These included the Engineer Route Clearance Package, the Logistic Convoy Element, a composite Armored Security Vehicle platoon, the commander's Personal Security Detachment and a liaison team to a NATO infantry company. With the majority of medics in the field on a day-to-day basis, the main battalion aid stations, which were already conducting split operations, were often manned only by one credentialed provider and one or two medics. Following the initial casualty experience, further analysis of the medical support plan determined that each firebase should have at least two combat medics. This would provide the firebase leadership the ability to send one medic out on patrol while leaving one medic at the firebase in the event of an attack. Based on this analysis, an additional medic was moved to each of the firebase, sometimes using a medic augmented from other brigade units. We recommend that this practice be implemented by any unit supporting firebases where there are not enough medics to provide simultaneous medical coverage at the firebase and with patrolling units.

Expanded equipment and capabilities

In addition to increasing the number of medics at each firebase, our post-event analysis highlighted the need to equip the firebase aid stations to be able to hold patients for extended periods of time.

Each aid station was provided oxygen, additional litters, patient warming capability, an expanded formulary of medical equipment and supplies, medical reference books, additional trauma equipment and dedicated communication platforms. Major treatment protocols and algorithms were reviewed, revised and posted clearly in each aid station.

In addition to staged improvements in infrastructure and medical equipment at each firebase, additional medical capabilities were expanded through training initiatives. Providers at each Role I facility conducted regular training sessions and clinic-based teaching for the evaluation and treatment of both trauma and non-trauma conditions. Medics rotating in and out of the smaller firebases were permitted to carry and employ equipment for more advanced emergency procedures once they had demonstrated their abilities to the satisfaction of the Battalion Surgeon. Every medic was held to the same standard and had to show competency in essential trauma skills before being allowed to serve at a firebase. Over time, the scope of practice and competency level for the firebase medics significantly increased, translating into improved care for battle and non-battle injuries.

Proven communications plan

Given the non-contiguous battlefield, redundant communication systems allowed medical providers to export expertise and direct medical care at remote locations. For medics located on firebases, communication platforms provided a lifeline when patients presented with critical injuries or complex medical issues. While not a substitute for face-to-face patient interaction, redundant communication systems enabled improved care and oversight. While video telecommunications and e-mail consultation would have been optimal, few firebases had internet capability. Voice communications were typically the only form of communication. Redundant systems, such as civilian cellphone, satellite phone, voice over internet protocol phone and FM radio created a layered communications plan—and provided backup when one of the systems failed.

Providers proactively contacted their medics on a regular basis, both to provide routine medical consultation and to maintain constant situational awareness of the medical issues at each firebase. Additionally, the medical platoon leadership attempted to visit each firebase regularly to support their medics, gain a firsthand understanding of their conditions and conduct quality assessments.

Given the increased stress placed on medics at remote firebases, deliberate efforts to provide encouragement and constructive feedback were provided to each medic after significant patient care was performed and the patient was evacuated. These debriefings were conducted in person, if possible, or by telephone to both improve the provision of care and decrease the risks of burnout or stress accumulation.

While these changes were initiated and implemented in one battalion based upon our specific requirements, the training and resource interventions were shared with the other units in the theatre as a firebase risk mitigation strategy. For our unit, it became standard operating procedure to have at least two medics assigned to each firebase, and the practice was continued by the relieving unit. While quantitative measurements of trauma and non-trauma medical skills were not captured during the deployment, medic skills improved qualitatively based upon the condition of patients evacuated to higher levels of care with improve resuscitation and pre-hospital care.

CASUALTY CARE 1 YEAR LATER

In January 2008, an enemy combatant was shot in the chest during a direct fire engagement in a remote district. The on-scene platoon medic assessed the casualty and immediately sealed the chest wound. Due to adverse weather conditions preventing point-of-injury MEDEVAC, the casualty was ground evacuated in an up-armoured vehicle to the platoon firebase, which was supported by two combat medics. Air MEDEVAC was launched to retrieve the casualty but was forced to abort due to the inclement weather. The casualty's condition deteriorated while the medics discussed the patient's care with the battalion surgeon via telephone and radio. Following stabilisation with recurrent needle decompression, the medics cared for the patient in shifts with regular remote input from the battalion surgeon. Sixteen hours later, during a 30-min break in the weather, the casualty was evacuated on a CH-47 helicopter conducting an emergency resupply. En route care was delivered by an additional medic intentionally loaded on the helicopter at a prior resupply stop. The casualty was flown directly to the battalion aid station where the battalion surgeon performed tube thoracostomy and intubated the patient. Holding the patient at the Battalion Aid Station until further MEDEVAC was available, the patient was eventually evacuated to the Role III hospital at Bagram Airfield. This episode, like many others over the course of the deployment, validated the efforts made to improve the level and quality of care provided at remote firebases by isolated junior medics.

CONCLUSIONS

Our experiences in Afghanistan reinforce the reality that today's combat medics often find themselves in remote inaccessible locations, far from the direct supervision and support of a credentialed medical provider, with limited or absent ground or air evacuation capability. A medic's success under such challenging circumstances hinges upon prior preparation and planning. The unique challenges of firebase medical support must be taken into consideration during a unit's pre-deployment phase. Even with excellent pre-deployment analysis and planning, however, the medical platoon must be prepared for unanticipated difficulties and changes. Careful and recurring threat assessments to identify personnel, training and equipment gaps, as well as ongoing targeted individual and collective skills training, will mitigate the many risks associated with the delivery of effective firebase medicine, better support the mission and, most importantly, save lives.

Contributors While we worked collaboratively on this article, RLW assumes the responsibility as guarantor for the overall content of the article.

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