Preparedness for Resuscitation at a Geographically Isolated Army Troop Medical Clinic: Lessons From Camp Blanding, Florida

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ABSTRACT

Introduction: Many Servicemembers rely on nondeployed Role 1 facilities, such as troop medical clinics, as their primary source of healthcare. At geographically isolated military installations, these facilities are the "only game in town" for medical care. Servicemembers may present to these facilities with emergent conditions, regardless of designed intent of the facility or the wishes of staff. The U.S. Army Troop Medical Clinic, Camp Blanding is such a facility. **Methods:** The clinic was reorganized with a 5S approach, streamlining supply, equipment, and workflow processes. This was accomplished to allow the facility to not only improve its general delivery of care but also ensure capability to handle at least one medical or trauma resuscitation. Equipment, disposable supplies, documentation, and staff training were addressed. **Results/Discussion/Conclusion:** Despite facility intention, lack of supplies/equipment, or staff inexperience with emergency care, an acute ill or injured Servicemember must be stabilized at the nondeployed Role 1 facility while awaiting transport to a higher level of care. This expectation is the same as that of deployed Role 1 facilities. A cost-savings can also be realized when minor "emergencies" are handled in-house.

KEYWORDS: *aid station, troop medical clinic, sick bay, resuscitation, emergency medicine, primary care, National Guard, rural medicine, sick call*

Case Presentation 1

It is 1430 in the U.S. Army Troop Medical Clinic at Camp Blanding, FL. You and your staff cleared the facility of the morning's sick call patients and are engaged in administrative work. An Army captain bursts through the front door of the facility and shouts to the reception desk, "I have a heat casualty in the car; can you take her or do we need to drive to the ER in Starke?" You tell him to bring the patient inside and page staff to the trauma bay via the intercom.

Introduction

Many active duty personnel rely on dispersed battalion aid stations, sick bays, and troop medical clinics (TMCs) for their primary source of healthcare. In the Reserve and Guard component, healthcare available during inactive duty and annual training periods may be their only contact with the medical profession. Many military medical providers have noted that reservists will often present with chronic complaints because they have nowhere else to be seen. Additionally, some of these facilities—especially on Reserve and Guard training sites—are geographically isolated far from larger military treatment facilities (MTFs) or sources of civilian emergency care.

Many facilities without a dedicated emergency medicine service believe that emergency patients should "know better" than to come to their facility. The 6th Medical Group clinic at MacDill Air Force Base goes as far to post "No Emergency Services" on its welcome signs in the parking lot. Sometimes it is difficult for healthcare workers to identify those at risk for sudden decompensation; it is harder still for laymen. While we may hope as hard as we can, a worried "battle buddy," "shipmate," or "wingman" will seek help wherever they can find it. The lay public—including the line personnel we support—has an expectation that all medical personnel have at least some basic capacity for handling emergencies. Army Regulation 40-3 requires that "all MTFs will, during routine hours of operation, have the capability to determine if a patient care emergency exists and to initiate life and limb saving measures before providing definitive treatment or transporting the patient for definitive treatment."[1] The other services have similar requirements.

The McWethy Troop Medical Clinic at Fort Sam Houston is located less than 2 miles from the front door of the San Antonio Military Medical Center (SAMMC) emergency department and is across the street from the post's main emergency medical services (EMS) station. In this situation, it is reasonable for a TMC to provide

a lower level of emergency care. This is not the case at Camp Blanding, which is like many other Department of Defense installations such as Dugway Proving Ground and Pacific Missile Range Facility. In this setting of geographic isolation, the TMC or equivalent is the "only game in town" for many miles. In similar circumstances in the civilian sector, the "freestanding emergency center" concept has developed and is spreading rapidly.[2]

Camp Blanding, established in 1939, is located in Clay County, FL, southwest of Jacksonville. With 73,000 acres of land and capable of hosting up to a light infantry brigade as well as a battalion-sized opposing force, it is the primary training site for the Florida Army and Air National Guard.[3] The TMC, overseen by Winn Army Community Hospital, is the sole general-access medical facility on post, although several tenant units have small aid stations. This facility is equipped with a dispensing pharmacy, four general examination rooms, one trauma bay with ambulance bay and dual-aircraft capable MEDEVAC helipad, and a six-bed inpatient ward (one isolation bed) credentialed to hold patients up to 72 hours. Figure 1 displays the front entrance of the facility. As is usual in similar facilities, staffing typically consists of a primary care physician or physician assistant (PA) with two or three healthcare specialists (medics). EMS consists of a civilian EMS helicopter from Jacksonville and a civilian Clay County paramedic ambulance that is stationed on post but responds to the surrounding county area as well. The nearest hospital, 10 miles away from the main gate (approximately 15 minutes by ground under optimal conditions), is the 25-bed Shands Starke Medical Center, which does offer basic emergency services. The nearest trauma center is 41 miles from the main gate (approximately 50 minutes by ground under optimal conditions) at the 620-bed Shands Jacksonville Medical Center. Many patients with a need for inpatient care are transferred the nearest major MTF at the 64-bed Naval Hospital–Jacksonville, 29 miles away (approximately 44 minutes by ground under optimal conditions).

Figure 1 *U.S. Army TMC at Camp Blanding, FL, front entrance.*

Case Presentation 2

On Friday, 13 June 1997, at 0228, Major A.B. was pronounced dead on arrival at Shands Jacksonville Trauma Center after more than 2 hours of what was described as a "comedy of errors" in the response to his tragic accident.[4] MAJ A.B., a decorated member of the 82nd Airborne Division, was grading a major field training exercise for the Maryland Army National Guard. While observing an ambush lane on a supposedly closed road, he was run over at 0015 by a 2½-ton truck that was driving under blackout conditions. Due to communication failures with Range Control (the post's 911 center) and obstacles placed along the roads for the exercise, the medics in the first field litter ambulance (FLA) did not arrive until 0045. They found him combative with a fractured pelvis and rigid abdomen but were unable to restrain him and provide spinal immobilization as their FLA had not been stocked with a cervical collar. A second ambulance was called in, and the patient was transported to the TMC for aeromedical evacuation. Due to lack of communications and prolonged timeframe, the civilian MEDEVAC helicopter called by range control had been forced to return to base due to fuel concerns. The PA on duty in the TMC documented only a brief neurologic exam and MAJ A.B. was loaded at 0138 into a waiting nonmedical UH-1 "Huey" aircraft for transport to Naval Hospital–Jacksonville accompanied by two ground medics. The PA called ahead to the Naval Hospital and was told to send the aircraft to Shands Jacksonville as there was no surgeon on duty, but it was too late and the aircraft had switched off of Camp Blanding's radio net. They arrived at the Naval Hospital's remote helipad at 0150, where they waited 8 minutes for an ambulance to come from the emergency room for pickup as staff had anticipated the patient had been diverted. Apparently unprepared and upset, they insisted MAJ A.B. be sent to the trauma center. The confused and likely overwhelmed medics hurried back to the helipad and loaded MAJ A.B.'s litter back into the "Huey," where he went into cardiac arrest. They performed CPR on the 3-minute flight to Shands Jacksonville, where he was pronounced dead. Florida National Guard leaders vowed not to let this tragedy happen again and responded primarily by allowing the local civilian EMS system to station an ambulance on Post. MAJ A.B. was buried at Arlington National Cemetery, leaving behind a wife and then 5-year-old daughter.

Methods

Overview

Student medical officers stationed at University of South Florida College of Medicine first supported the Camp Blanding TMC in February 2013. The TMC had undergone a major renovation in 2009, adding a new

ambulance entrance overhang, new cabinetry, and staff locker rooms. During this process, many of the medical supplies and equipment had been moved into a large intermodal shipping container behind the facility and not replaced. A single full-time noncommissioned officer was responsible for not only the TMC but also all medical operations and medical readiness concerns for the whole installation—an impossible task. Exam room cabinetry contained an illogical hodgepodge of various vintages of supplies dating back to the 1970s. Exam rooms did not even have wall-mounted oto/ophthalmoscopes or blood pressure cuffs. The trauma bay was equipped with a 1980s-era vintage Burdick defibrillator and a broken 1970s Foregger laryngoscope handle with only several Miller blades that were missing their bulbs. Two massive stainless steel cabinets consumed much of the space in the room.

We used the renowned 5S methodology (Sort, Set in Order, Shine, Standardize, Sustain) to guide our transformation of the clinic.[5] Our primary goal and outcome were to improve overall clinic functionality and ensure the capability to provide resuscitation for at least one critical trauma or medical patient until a civilian MEDEVAC aircraft could arrive. The specific procedures we deemed necessary are listed in Table 1, which should be noted to correspond closely to the care provided by civilian paramedics.

An improved charting system was implemented with medicine and trauma template overlays created for the SF600 were used instead of the SOAP notes of variable quality done in the past for each patient. Exam room cabinetry was standardized and organized for efficient care of the general medical patients who were seen. Blood pressure cuffs, electronic thermometers, and oto/ophthalmoscope sets were mounted to the walls. Exam room lights and Mayo procedure stands were added to each room. The large cabinets in the trauma bay were moved to the ward area and used for room resupply stock, greatly freeing space in the trauma bay for the resuscitation team and equipment. A code cart with modern ACLS defibrillator, Propaq 206EL patient monitor with mainstream capnography and invasive pressure capability (Welch Allyn, Skaneateles Falls, NY;

Table 1 *Necessary Capabilities at Nondeployed Role 1 Facilities*

Basic airway management (oral/nasal airway, suction)
Supraglottic airway placement
Endotracheal intubation (video and direct laryngoscopy)
Cricothyrotomy (needle and open technique)
Bag-valve-mask ventilation
Wave form (preferred) or colorimetric capnography for tube placement
Oxygen administration (nasal cannula and nonrebreather)
Nebulized medication delivery (albuterol, ipratropium)
Needle thoracostomy
Tube thoracostomy
External hemorrhage control (including tourniquet placement)
Cardiac rhythm monitoring
Pulse oximetry
12-Lead electrocardiogram
Cardiopulmonary resuscitation
Manual defibrillation/synchronized cardioversion
Transcutaneous pacing
Peripheral intravenous access
Central intravenous access
Intraosseous access
Parenteral medications (nitroglycerin; aspirin; ACLS; anaphylaxis; antiseizure, pain, and antinausea medications)
Point-of-care blood glucose testing
Pericardiocentesis
Bedside ultrasound (specifically FAST exam)
Pelvic exam (including management of incomplete abortion with ring forceps)
Precipitous vaginal delivery
Foley catheterization
Naso/orogastric tube placement
Hypothermia/hyperthermia management (warm blankets, etc.)
Advanced epistaxis management (balloon catheters and posterior packing)
Basic extremity splinting (SAM splint, etc.)
Spinal immobilization (cervical collar and backboard)
Pelvic stabilization (bedsheet or commercial binder)
Military antishock trousers (MAST)
Femoral traction splinting
Laceration repair (sutures and staples)
Basic laboratory studies (point-of-care urinalysis/chemistry/cardiac enzymes/hematology)
Arthrocentesis
Lumbar puncture
Basic dental stabilization (IRM/Fuji IX, Dycal, dental anesthesia)
Basic ophthalmology (Fox eye shields, eye irrigation, fluorescein exam)
Chemical agent treatment (ATNAA and CANA injectors or equivalent)

Note: Items in **bold** may be omitted for facilities with adequate EMS coverage close to supporting MTF emergency departments.

http://www.welchallyn.com/), Level 1 H-1025 rapid infuser (Smiths Medical, Dublin, OH; http://www.smiths-medical.com/), and an inexpensive piped-oxygen system using two H-cylinders was installed. Cricothyrotomy and tube thoracostomy setups were staged similar to the SAMMC ER. Intubation supplies, to include a fiber-optic laryngoscope with disposable blades, were stored in a Flambeau box with break-away seal. An ear/nose/throat/ophthalmology box was added with epistaxis catheters, Wood's lamp, and other supplies. A commercially available emergency dental box was obtained. Blanket/fluid warming cabinet, urinalysis machine, and a working 12-lead electrocardiograph machine were installed in the facility. Figure 2 displays the current state of the trauma bay, Figure 3 shows the inpatient ward.

Figure 2 *Current state of the trauma bay.*

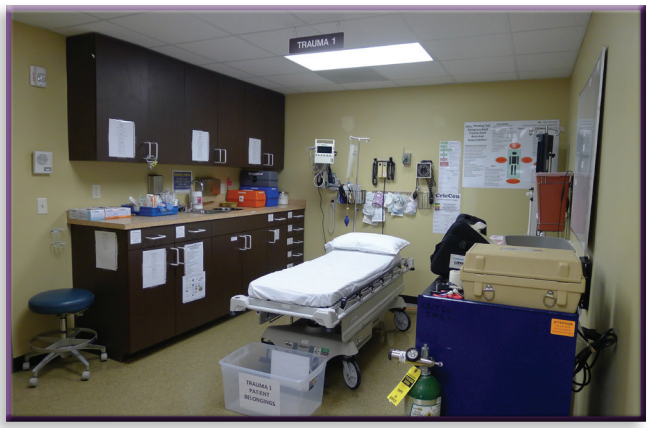

Figure 3 *Inpatient ward.*

Areas for continued improvement include the addition of a portable slitlamp and electronic tonometer to better assess eye complaints, reestablishing the basic radiographic capability that was removed during the 2009 remodel, as well as a Broselow Pediatric Resuscitation System cart (Armstrong Medical, Lincolnshire, IL) in the event of a critical pediatric patient presenting to the facility.

Equipment/Supplies

A major hurdle was the lack of proper equipment to conduct medical or trauma resuscitations. It is difficult to justify the purchase of new major items of durable medical equipment for a facility that is not intended to be a primary receiving site for the critically injured or ill. The Tri-Service Medical Excess Distribution System (TRIMEDS) is an excellent resource allowing units to obtain a wide array of expensive medical equipment that is otherwise going to be disposed by the offering unit as surplus. Accessible online by all DOD personnel using a Common Access Card at https://medlog.us.af.mil, this program allows a user to view all "excess" equipment in DOD facilities worldwide. Requesting the equipment requires the unit establish a Defense Medical Logistics Standard Support (DMLSS) account with the Defense Health Agency—or coordinate with a supporting MTF. Use of the DMLSS system is almost universal within Military Health System facilities. As a general rule, this equipment may be several years old, but is in functional condition. With patience and a keen eye one can obtain whatever is needed. As an example, the authors obtained a 2-year-old LIFEPAK 20® Defibrillator/Monitor (Physio-Control, Redmond, WA; http://www.physio-control.com/) as excess from an Air Force facility that had recently "upgraded" to a different brand. The requesting entity need only pay for shipping of the item to their location. Tutorials and updated points of contact for this process are easily found online.

Another option is the Reutilization Program of the Defense Logistics Agency (DLA) whereby vast quantities of medical (and all other classes of supplies/equipment) that are turned in by "line" units can be requested by another unit. DOD "customers" have the highest priority for requesting property. Durable medical equipment, bulk quantities of disposable supplies, even complete field Medical Equipment Sets are turned in to DLA all the time. Often, no one requests the property within the 45-day window and it is sold to surplus dealers at bulk auction by DLA's contractor. A tutorial to this process can be found at https://www.dispositionservices.dla.mil/change/RTD-DOD.pdf.

Other concerns are the small stock of disposable supplies and pharmaceuticals necessary for resuscitation. Agreements should be made with parent/supporting or neighboring large MTFs to exchange these items as expiration dates approach and prevent waste.

Training

While the first hurdle one encounters may be the lack of "the right stuff," even the most well-equipped facility is useless without the knowledge to use it properly. Even if technically competent in emergency procedures, personnel also require confidence in their own abilities to perform advanced skills in an emergency situation.

Advanced Cardiac Life Support (ACLS) and Prehospital Trauma Life Support (PHTLS) courses were offered to the unit primarily responsible for providing staff to the TMC. However, a particular challenge in the Reserve and Guard setting is that physicians and medics only drill monthly. Medics may work daily in a field completely unrelated to medicine, and even on Active Duty, the physicians and mid-level personnel who often staff these facilities do not have emergency medicine training or experience. A study of endotracheal intubation in deployed Role 1 facilities—typically staffed with primary care physicians and mid-level providers as well—found a significantly decreased success rate compared with Role 3 facilities (TD Anderson, RL Mabry, P Allen, SL Love, unpublished information). Taking an entire drill weekend away from staff with the myriad of administrative pressures and requirements on them to complete an ACLS course is difficult, to say the least. These personnel are often unlikely to obtain this training at their own expense when they believe it does not relate to their daily life as an automotive mechanic or family medicine PA.

This may be less of a challenge in the active duty setting, where ACLS and PHTLS/TCCC training as a minimum should be mandatory for all medics and providers. Mid-level providers and physicians should take advantage of the weeklong Tactical Combat Medical Care (TCMC) course offered at Fort Sam Houston. This course is specifically intended for providers in the deployed Role 1 setting and focuses on applying Advanced Trauma Life Support (ATLS) principles in a resource restricted environment.[6] Scenario-based training where the clinic staff must function as a team during a mock resuscitation should be a matter of clinic routine. Refresher training on procedures should be executed frequently.

Discussion

While work remains to be done, the Camp Blanding TMC is now far better prepared for the regular stream of urgent and emergency patients who present to the facility. These lessons could and should be applied to other geographically isolated Role 1 type facilities. The equipment and supplies to accomplish these tasks are rather minimal when the scale is only indeed just one "emergency room." Similar points could be made for even those facilities that are close to major MTF's, where the equipment could take the form of a single "emergency cart." Even at major installations, EMS response may be delayed in certain instances and clinic staff must be prepared to manage a critical patient for up to 20 minutes. Mass casualty situations may require any medical facility—regardless of location—to perform outside its comfort zone. Training investment in emergency care is never a waste, keeping providers and medics sharp for their "war mission" role during deployments. In the setting of "prolonged field care," these skills would be especially valuable. All military midlevel providers and physicians, regardless of specialty, should have both the competence and confidence to handle critical patients, at least to the level of a paramedic. With this backdrop of war readiness, the greatest military in the world should not rely on local civilian EMS to be its primary safety net.

If the raison d'être for military medicine is summed up as "To Conserve Fighting Strength," taking care of our Servicemembers in their hour of greatest need is a part of that. Not only can we provide initial stabilization until proper transport is possible, the authors assert that handling relatively minor "emergencies" in a calm and collected manner within the geographically isolated TMC presents a major cost savings versus civilian emergency care paid for by TRICARE.

Case Presentation 1 Conclusion

A 25-year-old female second lieutenant is assisted into the trauma bay by clinic staff and her soldiers. Her responses to questions are slowed and she appears lethargic. Her skin is moist and flushed. Your team quickly disrobes the patient and places her in a gown. They apply the cardiac monitor and pulse oximeter and obtain vital signs. Cardiac rhythm strip shows sinus tachycardia: heart rate, 104; blood pressure, 128/78mmHg, respirations, 24; Sp_{O_2}, 98% room air; and temperature, 99.8°F orally. An 18-gauge peripheral intravenous catheter is placed in the right antecubital fossa on a second attempt. Lungs and heart tones are clear, abdomen is benign, and rapid neurological exam reveals no focal deficits. A 500mL bolus of lactated Ringer's is given with dramatic improvement in the patient's mental status. A 12-lead electrocardiogram and urinalysis to include human chorionic gonadotropin is negative. The patient is observed for 2 hours of oral rehydration until urinating clear and is discharged to her unit with light duty restriction. As your patient departs, the staff are bringing a Soldier with a bandaged hand into Exam Room 1…

This single case—often repeated—illustrated not only achieving the patient-focused care military medicine espouses but also supported the overall mission of the unit while saving TRICARE the substantial sum potentially incurred with a civilian emergency department visit. Key points from this article are summarized in Table 2.

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Table 2 *Key Points*

Servicemembers can and will present with urgent and emergent conditions to any medical facility.
At many geographically isolated installations, the TMC or equivalent Role 1 facility is the "only game in town" for medical care.
The facility's designed intent or staff discomfort with providing emergency care should not be a factor when the sick and injured arrive on their doorstep.
All nondeployed Role 1 facilities—and those staffing them—should be prepared to provide the initial steps of resuscitation for any "emergent" condition, just as is expected in the deployed environment.
Substantial cost-savings are realized with handling minor "emergencies" within the MTF rather than needlessly transferring to civilian care.

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Disclaimer

The views expressed in this article are those of the authors and do not necessarily reflect the official position or policy of the U.S. Army, Department of Defense, or U.S. Government.

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