

Lessons Learned from Bravo Surgical Company (Part of I MEF) in Operation Iraqi Freedom

CDR V. POTHULA
DIRECTOR OF SURGICAL SERVICES
US NAVAL HOSPITAL, YOKOSUKA, JAPAN
PSC 475 BOX 1752
FPO AP 96350

CAPT JAMES CHIMIAK
DIRECTOR OF ANESTHESIA SERVICES
NAVAL HOSPITAL, CAMP LEJEUNE, NC 28547 USA

CDR ANIL TANEJA
HEAD, ORTHOPAEDICS
NAVAL AMBULATORY CARE CENTER
GROTON, CT USA 06349-5600

pothulav@nhyoko.med.navy.mil

NATO Research and Technology Agency conference

NOTE: The opinions expressed herein are those of the authors and not necessarily the view of their commands, Naval Medicine, the Department of Defense, or the United States. Some of the recommendations in this report are already being put into place.

ABSTRACT

Problem: The combat medical delivery system for the US Marines was redundant and seriously hampered by marginal leadership.

Background: There are multiple demands on a combat medical delivery system, which often are in direct opposition of one another. Compromise of these demands without careful forethought will significantly weaken a system and even lead to its ineffectiveness. One must remember that an advanced medical delivery system is a large logistical liability to the combat support commander. The closer to the front lines, the more difficult it is to support. Concrete evidence to show real benefit is required to justify supporting this liability. To state the simple yet often overlooked obvious, if the medical system can not deliver average level of care for a severe mass casualty, then it should be dismantled.

One of the difficulties in building a modern system is the extraordinary success seen since the Vietnam conflict. In modern conflicts since, we have been confronted with an inept foe without airpower matched against our highly trained, high tech (offensive and defensive gear) war fighter. Our casualties have been extremely low and therefore never taxing our medical system. Medical personnel dedicated to make the system work covered the deficiencies. In essence, one could erroneously conclude that medical delivery requires no overhaul. One could accept this do-nothing attitude if the assumption can be made that we will

Paper presented at the RTO HFM Symposium on "Combat Casualty Care in Ground Based Tactical Situations: Trauma Technology and Emergency Medical Procedures", held in St. Pete Beach, USA, 16-18 August 2004, and published in RTO-MP-HFM-109.

Report Documentation Page

*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 01 SEP 2004	2. REPORT TYPE N/A	3. DATES COVERED -			
4. TITLE AND SUBTITLE Lessons Learned from Bravo Surgical Company (Part of I MEF) in Operation Iraqi Freedom		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Naval Hospital, Yokosuka, Japan PSC 475 Box 1752 FPO Ap 96350		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM001795, Combat Casualty Care in Ground-Based Tactical Situations: Trauma Technology and Emergency Medical Procedures (Soins aux blessés au combat dans des situations tactiques : technologies des traumatismes et procédures médicales d'urgence)., The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 10	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

always have air superiority and overwhelming force with minimal US casualties in any future conflict. I propose the opposite and that we prepare for a future formidable foe in which we will confront high casualty rates and difficulty with air superiority limiting patient evacuation.

The purpose of this paper is to cite these discrepancies and offer practical solutions. Overcoming the inertia of “if it ain’t broke, don’t fix it” mentality is crucial to transforming a medical system that had not been updated in one or two decades. An analogy is that the coalition forces could have still had a military victory utilizing Sherman tanks and M-1 rifles. This would have generated a complacency that concluded no changes were needed. This conclusion would be disastrous. Our medical shortcomings must continue to be recognized and fixed now.

I will break the problems down to headings that will be listed as annexes. They will consist of three paragraphs: Issue/Discussion/Solution.

The common denominator for each of these medical units is a central Shock Stabilization Unit (SST) and prompt transport to definitive care. The vital link is medical evacuation availability. Its degree of nonavailability defines what type of holding capability is needed as well as basic surgical capabilities for life threatening conditions that will not tolerate any delay and cannot be stabilized in the SST.

1.0 PART I – ADMINISTRATIVE ISSUES

The following lessons learned are put in a three-paragraph format. The first paragraph is the issue, the second is a brief discussion of the issue and the third paragraph outlines a solution. They are not listed in any particular order.

1. The wrong professional mix reported to the AOA.

THCSRR’s¹ approach to “find a home” for every TRICARE friendly specialty by giving them a wartime mission was not a good idea. It delivered podiatrists instead of orthopaedic surgeons, OB/GYN instead of trauma surgeons, pediatricians instead of surgical intensivists and labor nurses instead of ICU nurses. Fortunately, there were few Marine casualties. The surgical company could only utilize one-third to one-half of its Main OR beds due to lack of surgeons. One can only look back in horror if a dozen critically injured Marines had been evacuated to the surgical company.

Modify THCSRR. From the ground up, look at how many critical combat skilled professionals are needed – Ortho, general, Neurosurgeons, Anesthesiologists, Intensivists, ER physicians and nurses (ER, ICU, ward) Send the birth product line out into the network; it costs more than we take in, gobbles resources and is high liability.

¹ THCSRR is the Total Health Care Support Resource Requirements Allocation Plan. It identifies those personnel required to meet the day-to-day operational support to the Navy and Marine Corps mission, the wartime mission and those personnel required for sustainment.

2. Not enough emergent resuscitative, perioperative and intensive care physicians assigned to the unit.

There were not enough physicians to respond to airway and vascular access concerns in the ER and still be able to supervise the perioperative care of the combat casualty. There were no intensivists assigned to the ICU.

Change the ratio of CRNA and Anesthesiologist. I recommend five to six anesthesiologists and three CRNAs to allow full coverage as intensivist for the ICU, supervision for the three OR's as well as assist in the SST for resuscitative emergencies.

3. Unsatisfactory staffing

There is a poor mix of nurses and physicians (see above). For higher patient flows, Bravo surgical company would not have met its mission.

Recommend the following manning:

SST 4-6 ER physicians with 1 FP and 1 PA

Anesthesia 5 anesthesiologist one to assist SST/OR, 2 for intensivist/OR and one for each OR, 3 CRNAs

Surgery 4 general surgeons and 3 orthopaedic surgeons

(if medical company becomes modularized then one each of the specialties ent, uro, neuro) if humanitarian peds, ob/gyn, for women one ob/gyn would be good

ICU- 3 intensivist and 6 icu nurses

Ward mixture of Internal med, FP and peds

4. Critically skilled physicians were allowed to remain in positions that could have been filled by GMOs.

There were several specialty-trained physicians such as neurologist, cardiologist, pulmonologist, ICU, and even anesthesiologist that were filling STP or GMO positions. They were critically needed in the surgical company. There were multiple trauma trained general surgeons; orthopaedic surgeons and anesthesiologists in Echo and Foxtrot companies that did not have a mission but could have been used.

A coordinated medical leadership that is supposed to know what physician assets are in theater. Identify them and switch them to best configure the entire medical function in the AOA.

5. Establish a robust officer and enlisted FMF qualification

The medical company lacks a cadre of long-term medical professionals that stay with the company. Current policy is to treat them like a temporary group that comes and goes. A lack of community exists secondary to a lack of interest and concern to recruit good people. Poor techniques, outdated equipment and confused medical leadership results.

Institute training, encourage TAD course attendance, allow one to stay with surgical company throughout their career to maintain a professional core similar to flight surgery and undersea medicine. Grade unit and MTF leaders by their ability to recruit and maintain such a group. Establish FMF qualifications to distinguish those that stay with the program.

6. Poor interaction between MTF and Medical Battalion.

A blue side / green side division exists that is unacceptable. The MTF is skewed to a managed care philosophy that is driving away great physicians and nurses and displeasing our line commanders. The green side is more concerned about non-medical operational issues than even line commanders themselves at the expense of quality medical care. A blending of the two sides would fix the problem.

Roll the Med battalion under the MTF with its CO in charge of Med battalion. The MTF rolls under the MEF surgeon. The MEF surgeon must have served as a previous MTF CO or XO

7. Modularize the company in functional areas

The complaint for medical company is that it is too big and too slow and hard to move. It is thought to have become irrelevant in today's fast moving Marine combat operations. Yet the little FRSS with its meager ability to handle large number of casualties is clearly inadequate in major battles where casualties are expected.

The component parts of the each platoon need to be broken down into its smallest independently functioning pieces and loaded into containers appropriately. When a mission arises, then the appropriate number of ORs and ward can be sent with the SST to the assigned location. Remaining assets, including a hotel services platoon that holds the laundry, berthing tents, showers etc., can follow this movement. With this doctrine, medical company can be ready to receive patients in hours instead of days with only a moderate lift requirement.

8. Medical battalion was unable to accept all the missions requested by the commanding general

The surgical company was directed to perform emergent combat related trauma surgical intervention. Its supply and somewhat its personnel attempted to reflect this very narrow medical assignment. Consequently, it could not perform sick call, emergent medical treatments, i.e. myocardial infarction and humanitarian assistance, despite having personnel that were more than qualified.

Form platoons to various missions. A purely combat surgical platoon should have general and orthopaedic surgeons with a robust intensive care staff with multiple intensivists. A platoon of primary care physicians that can handle ward as well as humanitarian missions. An additional list of augmentees such as OB GYN and pediatrics personnel should humanitarian mission be a part of the operation.

9. Communications were unacceptable

At no point upon landing into the area of operations was I ever afforded a means to communicate other than a mail. I was unable to obtain information on equipment, supplies and most importantly medical information. In this era of Internet and cellular communication in addition to convention military communications systems, our capabilities were unacceptable.

Identify a minimum level of communications and then double that need. Verify and re-verify that communication gear and personnel are onboard to operate and maintain them.

10. Poor medical Intel

On a number of occasions, poor medical information/Intel resulted in surgeons guessing what is available out there since information of the availability of services at other facilities and the amount of time/wait anticipated to get them their was unknown

Assign an aggressive medical Intel team that constantly updates its knowledge of all available theater assets and the time required to get there.

11. Medevac was troubled on occasion

Difficulty in communicating with medevac operations resulted in time delay or unnecessary holding of the asset on the flight pad.

Consider an embedded USAF unit to handle the coordination of the medevacs. This will require USAF personnel to learn more about USMC operations and the sometimes-tortuous command chain to obtain medevac

12. Medevac could improve

Need to identify lifts of opportunity would expedite care. Physicians identified to accompany patients.

Utilize flight surgeons for medevac transport. They have the skill and the situational awareness for the job. In addition, when they are not needed they are working with their squadrons. This cadre can also be enlisted and educated about surgical company so they return to it when they become specialty trained later thus forming our next generation of surgical company leadership.

13. Eliminate rank inversion

The assignment of junior officer in charge of senior more experienced officers is a flawed policy. Junior/senior relationships throughout the command were adversely affected. Working with officers outside the command was a confused process, as commanders outside the command sought the unempowered senior officers for assistance

Identify, train and place senior medical officers as CO. Train junior medical officers in their early tours by placing them in charge of divisions with organic senior enlisted.

14. Lacked a pediatric capability

Children will always arrive in a conflict, face up to the fact and be prepared

Bring a pediatric amal for preop, operative and post op care

15. Infectious disease risk

Staff suffered a gastroenteritis outbreak. Flies landed on surgical field

Assigned PMT to company. Have bug lites and traps in OR

16. Initial consumable and equipment allotments were inadequate

The AMAL lists for consumables were inconsistent. For a double operating room that was to handle 25 serious casualties there were shortages of both medications and consumables. In addition, the Propac did not have SaO₂ and CO₂ monitoring capability, two devices that are affordable, durable and increases the quality of care. These instruments had to be taken from the enroute care boxes (someone had the foresight to give enroute care personnel these essentials but neglected the OR and ICU

Go through a major mock OR case. Lay out the equipment and consumables used. Multiply those items by 25 to obtain what should be in the AMAL. Use the same consumable numbers to make resupply cans. Purchase one propaq with SAO₂ and CO₂ monitoring capability for each or bed, each ICU and each SST.

17. Equipment familiarization and checkout was poor

There was an ongoing problem with familiarization and maintaining the operability of the company's equipment.

Transfer equipment to CO MTF (deployed company commander) for daily use in the MTF. This equipment is cycled in and out of the MTF. It is to be maintained in a high state of readiness and repaired/replaced immediately when broken. It is marked medical company and shipped out when needed.

18. Problems with sterility procedures

There are problems with both sterilizing and maintaining things as sterile. Sterilizers failed under combat conditions.

Recommend obtaining Genesis pans, cidex, boiler tech/biomed tech check out sterilizer prior to deployment to include a full boiler hydro check, cssr tent with shelves and two tables, double ply instrument wrap, dust cover for sets

19. Consumables were lacking

There were consumables that were needed in greater supply

Wider and greater supply of suture material

Irrigation fluid with a warmer for fluids

Tape

Non-sterile gloves

Arm boards

Foley catheter

Pediatric ET tubes and IV catheters

20. Advanced monitoring equipment

A shortage of monitoring equipment (pulse oximetry, end tidal CO2 and temperature) existed on the ward, ICU and to the operating room to a lesser extent.

End tidal CO2 must be available for each MOR beds (six) with one spare. The ICU should have two of these monitors to help manage ventilator patients. Specifically a dozen more dependable pulse oximeters with additional probes for attachment. Propac has YSI temp probes that work well for continuous monitoring of body temp. Seven for the OR, 3-4 for the ICU. Tympanic temp probes for the wards.

21. Equipment difficulties

The following problems were encountered by periop nursing:

- Different litter did not fit well, need straps
- Need arm boards to perform orth cases
- Brushes to clean crevices of the or table well
- Poor ortho support- not enough external fixation devices
- Not enough xeroform or bulb syringes
- Preprinted pt log book for the or
- More trauma scissors so everyone has one set to cut away dressings, clothing etc without injuring pt
- Fluid warmer for iv fluids and irrigation fluid
- Step ups for the various heights of the surgeons
- Holders for garbage bag liners
- Attachment to hold IV bags to the table
- Cots that allow head up and head down position
- Large number of plastic buckets and detergent to encourage personnel to wash clothing
- Ample supply of deet and premethrin

22. Medical leadership in theater was overlapping, often weak, misinformed and without a chain of command

There were multiple medical leaders in the AOA that quickly asserted “they were in charge” but failed to deliver on action routinely. A fragmented chain of command prevented medical leadership from forming a comprehensive plan. It was very difficult to find a leader who had the large picture and medical contingencies for possible emergencies. The humanitarian assistance football was disgraceful. The problem was evident a year ago yet it was being addressed as line commanders brought child casualties to medical units that were intentionally not given the AMAL to address humanitarian issues.

Identify the medical chain of command starting from the MEF. If a unit commander disagrees with a medical plan or policy, have him take it up with the CG.

1.1 PART II- CLINICAL MATERIAL

Rectal Injuries

Classic teaching of of treatment of rectal injuries includes four Ds

- Diverting colostomy
- Drainage
- Debridement
- Distal wash out

The last part of the treatment protocol is questioned in the civilian trauma cases and only first three are instituted in many centers. It was pointed out that only high velocity military injuries warrant distal rectal wash out. We had two cases of rectal injuries. Rectal exam was grossly positive for blood. Urine was clear. Patient underwent exploratory laparotomy, diverting colostomy and drainage. Skin was left open.

Patients were cared post operatively at rear echelon facility. No distal rectal wash out was performed. JP drains were removed between 5-7 days. Patients were subsequently transferred to Iraqi civilian hospital 14 days later in stable condition.

Based on the limited data, the following conclusions are drawn.

- No diagnostic tools available to detect rectal injuries. High index of suspicion is required.
- We did not have tables to place patients in lithotomy position. It makes proctoscopic exam very difficult and placement of presacral drains almost impossible. Our patients had drains placed anteriorly.
- Distal rectal wash may not be necessary for healing of rectal wounds even in military setting. More number of cases are required to validate the point.

Vascular injuries:

We attempted vascular repair with placement of prosthetic shunts. One was in upper extremity and it clotted off almost immediately. Patient required amputation. 2nd repair was in lower extremity. Shunt remained open in the immediate post op period. However, it clotted off during transport and patient had amputation. Attempting repair with native vein is very time consuming and not practical at the front lines. Better alternatives need to be explored for vascular injuries.