



**United States Central Command
Joint Theater Trauma System
HQ, BAF, APO, AE 09354**



MEMORANDUM FOR RECORD

7 February 2011

SUBJECT: After action report for MEDCOM Tasker 1039.01C. (90 Day TSC deployment of an Emergency Physician to serve as the medical director for **Enroute Critical Care Nurses (ECCN)** and MEDEVAC units performing patient evacuation in the Afghanistan AO)

1. References

- a. Order Number: SH -323-0002
- b. MEDCOM Tasker: 1039.01C

2. General: US Army flight medics, credentialed at the National Registry of Emergency Medical Technician-Basic (EMT-B) level, are not trained to perform critical care transport or aggressive advanced resuscitation at the point of injury like their civilian flight paramedic counterparts operating in CONUS. Based on feedback from the Theater Trauma Director following several adverse patient outcomes during MEDEVAC in late 2009, a request for forces was initiated for ECCN's to deploy to the Afghanistan. During fiscal year 2010, US Central Command, in accordance with Joint Publication 4-02.2, Tactics, Techniques, and Procedures for Patient Movement and Joint Operations, established a requirement for dedicated ECCN's (66H8A) to conduct and support enroute critical care transfers from Role II to Role III in Afghanistan in order to close the capability gaps in our current MEDEVAC model. These ECCN's deployed without a physician medical director or standardized patient care protocols. A tasker for this deployment was generated to determine if there was a role for a full time MEDEVAC Medical Director and if so, where would that person be best utilized (JTTS, MED BDE, IJC).

3. Chronology:

- a. Aug 10-Task Force 62 Medical Command integrated (17) 66H8A's into Role II and Role III military treatment facilities throughout the AO.
- b. Sep 10- An additional 66H8A was deployed and assigned to TF62 to serve as the ECCN Nurse Executive/Director.
- c. Dec 10-Physician Medical Director deployed for 90 days.
- d. Jan 11-Relief in place / Re-deployment of first rotation / Deployment of second rotation of (12) 66H8A's
- e. Feb 11 – Redeployment of Physician Medical Director.

4. Significant Accomplishments

- a. Established standardized critical care focused treatment protocols

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- b. Conducted liaison with the operational surgeons at the BN, BDE and DIV level who have oversight of the MEDEVAC assets to develop best practices and standardization
- c. Worked with the MEDEVAC team of the Joint Theater Trauma System (JTTS) to establish data and patient record capture into the Theater Medical Data Store (TMDS) and the Joint Theater Trauma Registry (JTTR)
- d. Conducted process improvement and trend analysis to feedback to the units
- e. Reported system and clinical concerns to the Director of the JTTS
- f. Moved about the theater to ensure the ECCN's were being properly utilized and have been integrated into their respective MEDEVAC / Role II units
- g. Provide EMS expertise to both 62nd MED BDE and the JTTS
- h. Provided lectures and training for MEDEVAC / PEDRO (Air Force PJ's) / ECCN's
- i. Conducted liaison with IJC Patient Evacuation Coordination lead to establish regional MEDEVAC working groups

5. Lessons Learned:

SYSTEM WIDE ISSUES

- a. Current MEDEVAC staffing model is outdated and based on Cold War / Vietnam era doctrine
 - i. Discussion: The contemporary operational environment stresses the legacy MEDEVAC model by 1) Increased numbers of post-op critical care patients being transported from Role II to III, 2) Unprecedented numbers of civilian transports including pediatric, geriatric and medical cases similar to civilian EMS, 3) Massively injured polytrauma patients who would have died in other conflicts, kept alive by tactical combat casualty care, improved protective equipment and early surgery. The geography of Afghanistan requires numerous Role II assets, often operating in split teams, be widely dispersed in the battlespace. These split teams cannot afford to send a provider with post-op patients without significantly affecting their capability. This has until recently forced a difficult decision....send the post-op patient with an EMT-Basic flight medic or degrade the capability of the FST and send a provider. The current capability gap has been documented in more than 40 AAR's since 2002 in both Iraq and Afghanistan. Lack of advanced flight medic capability has directly

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resulted in poor outcomes in multiple cases and was the impetus for the deployment of critical care nurses to fill this capability gap as well as the deployment of a physician medical director. A recent study that compared critical care trained flight paramedics from a US Army National Guard air ambulance unit versus the conventional MEDEVAC systems operating in OEF showed a 66% reduction in death at 48 hours post-injury in severely injured patients. Several recent cases illustrate the complexity and acuity of patients currently being managed by a single EMT-B flight medic.

1. Case from Jan 11: An EMT-B flight medic was dispatched to the POI to transport a US soldier injured in an IED blast. The Soldier had an unstable broken neck and was in spinal shock. He was transported to a nearby FST where he was intubated and placed on vasopressors while the blades were turning. This intubated, critical care patient with an unstable cervical fracture, in spinal shock, on vasopressors, was then transported by a single EMT-B to the Role III.
2. Case from Jan 11: An EMT-B flight medic transported a critically injured Marine following a penetrating wound to his head. The casualty was intubated in a STP (Role I) and evacuated with a single EMT-B flight medic. During transport to the Role III the patient's sedation wore off, he became combative, dislodged his ET tube, vomited, aspirated and became hypoxic requiring re-intubation in the ER.
3. Case from Jan 11: A US Marine was injured in an IED blast with bilateral lower extremity amputations and a massive pelvis injury evacuated by MEDEVAC with a single flight medic. Flight time was 18 minutes; medic placed an IV and infused Hextend. Patient arrived in extremis after receiving no pain medication with bilateral ineffective tourniquets, undressed wounds, no c-collar and no pelvic binder. He was immediately intubated and given a massive transfusion in the ER.
4. Case from Dec 10: An Afghan local national male sustained penetrating torso injury due to an IED blast and was initially treated at an outlying FOB. He was transported intubated and hemodynamically unstable with a

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pericardiocentesis catheter in situ by a single EMT-B flight medic. Patient was critically ill on arrival to the Role III. He underwent an immediate median sternotomy in the OR and was found to have a pericardial tamponade and left hemothorax. Pericardiocentesis catheter was dislodged in flight.

ii. Recommendation

1. Adopt the civilian critical care flight paramedic training model for all flight medics performing MEDEVAC IAW the 2009 International Association of Flight Paramedics position statement.
2. Adopt the civilian staffing model of dual providers for all Advanced Life Support patients.
3. Assign an EMS trained Emergency Physician to the MEDEVAC Preponency Division / US Army School of Aviation Medicine to develop systems of training, sustainment, process improvement and standardization that will bring the care of patients transported by MEDEVAC up to state-of-the-art civilian helicopter EMS standard.

b. Lack of standardization across units performing rotary wing evacuation within the AO

- i. Discussion: Significant variability in unit capability performing MEDVAC exits in the AO. The operational units have attempted to fill the capability gaps of our current MEDEVAC model with ad hoc methods that are not standardized and often have significant operational limitations. This creates a situation where different units/personnel have to be used for different missions. Further, no US Army standard treatment protocols exist, as these are significantly variable across different units. This variable capability degrades the MEDEVAC commander's flexibility to respond appropriately across the full spectrum of missions.

For example:

1. National Guard flight medics are often credentialed paramedics with extensive training / experience in critical care transport able to operate across the entire mission profile.
2. Regular Army flight medics with EMT-Basic credentials and are not trained to transport post-op or intubated

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patients, nor are they able to perform advanced airway or resuscitative interventions from the point of injury.

3. Medics in RC-S (101st ABN Div) attended an abridged paramedic program before this most recent deployment. Only 15% of the medics passed this accelerated program and while the remainder are “paramedic trained” they not credentialed as EMT-P’s. They have an expanded Advanced Life Support scope that #2 lacks, but still are not trained in advanced airway management / critical care transport skills.
4. Air Force PJ’s (PEDRO) are credentialed paramedics that operate in pairs but lack critical care transport skills and cannot transport ventilator patients. They are allowed to perform Rapid Sequence Intubation and administer blood products but these skills are rarely used or sustained.
5. Enroute Critical Care Nurses are able to transport intubated patients from Role II but are not allowed to go to a Battalion Aid-Station or a Shock Trauma Platoon to pick an intubated patient as these are considered Point of Injury.
6. British MERT (Medical Emergency Response Team) is able to bring a full resuscitation team to the Point of Injury and provide aggressive treatment to severely wounded casualties but their response time is sometimes longer than Army MEDEVAC or PEDRO.

ii. Recommendations:

1. Standardize MEDEVAC response across the different units by adopting the civilian critical care flight paramedic (EMT-P / FP-C) training standard that allows a single capability to perform the entire mission set from POI to Role III.
2. Develop a standard set of US Army patient care protocols based on civilian helicopter EMS standards that encompass the entire mission spectrum.

c. Unit flight surgeons lack the clinical skills, experience and credentials to supervise and train flight medics

- i. Discussion: Every GSAB flight surgeon currently deployed to Afghanistan is a PGY1 general medical officer with no additional training in out-of-hospital care, trauma management, medic

training, in-flight critical care, or medical oversight of a helicopter EMS system. In most cases, the experienced flight medics have more knowledge of enroute care than the physician supervising them.

- ii. Recommendation: Develop a training package for GSAB flight surgeons that includes in-flight patient care, principles of EMS medical direction and process improvement / chart review. The flight surgeon should be able to operate on the same level or higher than the flight medics.

d. No standard for Documentation / Process Improvement Measures / Data basing

- i. Discussion: Before December of 2010, less than 3% of the records in the Joint Theater Trauma System database included any documentation of care during MEDEVAC. MEDEVAC documentation is most often done after the patient transfer and goes only to the supervising flight surgeon. These patient care reports are kept locally in the unit for the Aviation Resource Management Survey otherwise known as the ARMS inspection. No process is in place that mandates inclusion of patient care documentation into the patients' medical record. Process improvement measures or patient care research is not able to be conducted because MEDEVAC care data is absent from the patient's medical record in the vast majority of instances. Further, no systems exist that capture adverse outcomes, protocol violations or sub-standard care outside of the individual MEDEVAC unit or GSAB. Lack of patient care documentation in the medical record and trauma databases is the greatest hindrance to developing data needed to drive improvements in MEDEVAC care.

ii. Recommendations:

1. Standardize MEDEVAC documentation to be done concurrently with patient care and handed off to the receiving medical team.
2. Develop processes with patient administration to collect and include MEDEVAC documentation as part of the medical record.
3. Change ARMS inspection standards whereby patient care reports are accessed via AHLTA or TMDS.

4. Work with industry/MC4 to develop a digital solution that allows for rapid, concurrent, documentation of patient care as well as EMS process and quality measures. Such systems exist as off the shelf technology today.
 5. Sustain the efforts of the JTTS MEDEVAC team to collect records, conduct trend and data analysis to feed back to the MEDEVAC community.
- e. The Patient Evacuation Coordination Cells assign missions variability across the RC's
- i. Discussion: The wide variety of capabilities of different units performing helicopter evacuation has caused the PECC's in the South and the Southwest to scale medical response according the severity of injury and types of patients based on the MIST / 9-line reports. This clinically-based dispatched model is a sound idea that is aimed at optimizing the patient's care during transport.
 1. In RC-SW, the MERT is dispatched for the most severely wounded, PEDRO is dispatched for ALS type cases and DUSTOFF for all others. MERT will be dispatched preferentially to PEDRO or DUSTOFF even when the latter units have a more rapid response time. The thought behind this decision is that even though MERT may be slower, resuscitation will actually be started for the patient sooner. For example, if MERT has a 15 minute response time to the POI and DUSTOFF a 10 minute response with a 10 minute flight subsequently to the Role II or III, MERT will be dispatched. In other words the patients' resuscitation will begin in 15 vs 20 minutes. This delay is perceived unfavorably by line and DUSTOFF commanders.
 2. In RC-S a "push" model was recently in use whereby the Role III would push a critical care flight nurse from the Role III to the FST and return. This seemed to be at the discretion of the individual providers at KAF who had critical care flight experience and in some instances resulted in delays in care.

Case from RC-S. A US Soldier was injured in an IED blast and suffered bilateral lower extremity amputations. He underwent resuscitative surgery at an FST co-located with a DUSTOFF unit. The FST's CRNA (CCATT trained) was prepared to fly with the

patient IAW the current JTS Clinical Practice Guidelines. The PECC stood down the transport and pushed a PEDRO element with an enroute care team from the Role III resulting in a delay in transfer.

Case from RC-S. 4 year old male child presented to the FST with a closed head injury. Movement was requested to utilize the co-located MEDEVAC unit and a flight surgeon which was IAW the current CPG's. PECC declined and pushed a enroute care team from KAF. One hour later while still awaiting transport, the patient's neuro status declined. He was taken for emergent decompressive craniotomy at the FST but lost vital signs and died during the procedure. The patient movement request was then cancelled.

- ii. **Recommendation:** Create regional Patient Evacuation Working Groups under the IJC umbrella. These groups should involve the Regional Commands, the Role II and III assets and the MEDEVAC units. Goal would be to develop standards and criteria for appropriate responses given the variability of the missions and capabilities of the different units within the RC's and synchronize these criteria with the affected units.

MEDICAL DIRECTOR ISSUES

- f. Deployment of a Medical Director has merit but needs further evaluation, resourcing and staffing to be a long term value added
 - i. Discussion: Deployment was in proof of the concept. The utility, timing, roles, and responsibilities of a follow-on, full-time medical director has yet to be determined. While there are significant system issues within Army MEDEVAC, these need to be addressed by the OTSG and the institutional AMEDD. Issues such as training, staffing levels, medical direction, protocol and equipment standardization, and patient documentation need to undergo significant examination and revision. This process needs to be directed by highest authorities of the AMEDD, Army and DoD leadership to be effective. A deployed medical director will have little impact or influence on these greater underlying systems issues that currently affect MEDEVAC without senior leader involvement.

ii. **Recommendations:**

1. Decision for follow on medical director will need to be made by the 62nd MED BDE in conjunction with the incoming BDE, JTTS, and CENTCOM.
2. No follow-on replacement is recommend until the roles, responsibilities, mission and reporting requirements are clearly defined and supported by all concerned including, CENTCOM, JTTS, 62nd and 44th Med BDE's, the emergency medicine consultant, etc.
3. **Conduct a full analysis of MEDEVAC at the OTSG / Joint / TRANSCOM level that includes current EMS / trauma system experts.**

g. Command relationships

- i. Discussion: The position is ADCON / OPCON to the 62nd Medical BDE, but TACON to the JTTR. Original tasker was with assignment to the JTTS. Senior rater is the commander of 62nd MED, rater the JTTS Director. Currently, the medical director does not rate or senior rate anyone. There is no supervisory or command authority over anyone in the JTTS MEDEVAC Team, the ECCN's or the within the MEDVAC community. As currently constituted, the Medical Director can only provide technical advice and assistance to the respective MEDEVAC units, the MED BDE and the JTTS Team.

ii. Recommendations:

1. Assign this position OPCON/TACON/ADCON to the deployed JTTS team/CENTCOM.
2. Allows for integration with the JTTS process and Theater Level oversight, albeit in an advisory role similar to the JTTS Director.

ENROUTE CRITICAL CARE NURSE ISSUES

h. ECCN Selection and Deployment

- i. Discussion: The ECCN's were deployed to fill a critical gap in flight medic capability, critical care transport. However, their deployment was not well planned or coordinated.
 1. **No selection process seems to have been done.** Selection seemed to be based simply on availability and AOC. Some did not know this duty involved flight, others did not have

recent clinical experience, and others were in questionable physical condition.

2. Initial planning to determine ECCN basing locations was done by the JTTS Nurse Manager in 2010 following a review of all MEDEVAC missions from 2009-2010.
3. Little coordination with forward units, operational planning or socialization with MEDEVAC units was done prior to deployment.
4. No pre-deployment sight survey was conducted.
5. A senior nurse executive was not deployed initially with the team nor involved in initial planning, selection and deployment.

ii. Recommendations:

1. Select ECCN's with recent clinical experience or after undergoing suitable refresher training.
2. Ensure ECCN's meet the same physical fitness requirements as the flight medics.
3. Ensure ECCN's can meet the demands of flight and have a current flight physical.
4. Identify the nurse executive well in advance of deployment and allow for that person to conduct a pre-deployment site survey.
5. If ECCN augmentation of US Army MEDEVAC units is to continue, this arrangement needs to be synchronized, socialized and fully supported by the Army Nurse Corps and the MEDVAC commanders / MEPD.

i. ECCN Pre-Deployment Training

- i. Discussion: The ECCN's were deployed with no pre-deployment training and no recent flight experience. The second group underwent some "just-in-time" training on arrival in theater. Conditions for this training, while undergoing ROSI, were sub-optimal. ECCN's DO NOT possess the invasive skills (airway , central venous and I/O access, chest decompression) and paramedic skills that civilian flight nurses are trained for.

ii. Recommendations:

1. Optimal: Develop a comprehensive training package to bring the ECCN's up to the civilian critical care flight nurse level.
 - a. Nurse to paramedic bridge ~250 hours
 - b. Transport Nurse Advanced Trauma Course - 24 hours
 - c. Tactical Combat Casualty Care ~24 hours
 - d. Airway and invasive skills training ~40 hours
 - e. Flight and aircraft familiarization –could be done in theater
 2. Minimal: Pre-deployment training as a group at the Center for Pre-Deployment Medicine at Fort Sam Houston, TX prior to movement to CONUS Replacement Center (CRC) that includes:
 - a. Transport Nurse Advanced Trauma Course – (3 days)
 - b. Tactical Combat Casualty Care – (1-2 days)
 - c. Field Training Exercise (FTX) with live tissue lab- (2-3 days)
- j. ECCN Role I / Battalion Aid-Station / Shock Trauma Platoon Response
- i. Discussion: Currently BAS's and STP's located on combat outpost are considered point of injury transports. The ECCN's under their current rules of engagement are not allowed to fly on POI missions. These COP's are in known locations, are secure and not usually under enemy fire. If a Role II were to be moved there, the security circumstances would be no different. Patients are transported to BAS's and STP's where they can be intubated, placed on a ventilator, undergo tube thoracostomy and resuscitation with fluids and/or blood products. These are critical care patients and require a critical care attendant to optimize patient care.
 - ii. Recommendation: Allow ECCN's to go to COP's / BAS's / STP's for patient pick-up.
6. Conclusions: After more than 9 years of conflict and more than 40 AAR's recommending the evolution of MEDEVAC to current civilian standards, no institutional change has been made. Continuing the legacy model has resulted and continues to result in documented sub-optimal outcomes and increased deaths

among patients transported by helicopter in the current conflict. Efforts have been made to overcome these institutional gaps by providers and commanders on the ground doing the actual day-to-day mission. These ad hoc fixes have included mandating providers fly on MEDEVAC (physicians, PA's, nurses), sending flight medics to local paramedic training programs during dwell time (101st and 82nd ABN Div), deploying the ECCNs, dispatch of higher capability units for more severely injured patients by the PECC's (in the South and Southwest), and the recent proof of concept deployment of a theater physician medical director dedicated to MEDEVAC.

Continued focus is required to optimize patient outcomes during helicopter evacuation. Adopting the civilian helicopter EMS standards of critical care trained flight paramedics would allow for a full response across the entire mission set that would include the POI and inter-facility transfers of trauma, medical and pediatric cases that are currently encountered in the AOR, as well as meeting the requirements of future conflicts and domestic disasters in CONUS.

If the ECCN's are to be a continued part of the MEDEVAC mission, the Army Nurse Corps needs to fully support this mission and the attainment of civilian critical care flight nurse competency that includes the invasive and paramedic skills needed to be fully mission capable. If the ANC supports this initiative, these critical care flight nurses need to be fully integrated into the MEDEVAC units, undergo Readiness Level Progression and aircrew integration, be on flight status, undergo the same survival training (SERE, dunker) that the rest of the aviation community undergoes. Further, it is the opinion of this author that for these nurses need to be fully mission capable, they must be able to go to the point of injury. This will also require some additional tactical training. A fully mission capable critical care flight nurse and a critical care flight paramedic team is the standard in 80% of the CONUS based helicopter EMS systems. However, if the ANC cannot fully support this initiative, a critical care flight paramedic team trained to the current civilian standards could perform at the same level.

//Original Signed//

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