

NEWS FROM THE FRONT

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Class VIII Blood Supply Support to Current Operations for Medical Planners



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This news from the front (NFTF) discusses the challenges of providing class VIII blood and blood products to austere theaters of operation. In many of the austere locations the Army operates in, Eastern Europe, throughout the Pacific, Middle East, and Africa, countries do not meet the medical standard that the U.S. requires. Therefore, such perishable CL VIII items as in blood must be supplied and sustained in theater from the U.S. or U.S. approved stores such as the Armed Services Blood Bank Center - Europe (ASBBC-E).

While this NFTF focuses on the Horn of Africa (CJTF-HOA), the insights and information provided are pertinent to all theaters and should interest medical service corps planners across the Army.

Insights common to operations across the Army:

1. Coordination for cold-chain management of blood with blood bank storage in route and ensure the blood issued does not have a short shelf life has been a challenge. During both Pacific Pathways (early on) and Saber Guardian (in Bulgaria and Romania) vestibule storage space for reagents, fluids, biologics, chemicals, resupply; blood, blood storage, cold chain management were issues. It is important to establish class VIII blood accounts at least six months prior to deployment.
2. The movement of CL VIII blood across multiple country borders is a challenge because of the difference in custom protocols. It is important to gain the custom requirements for each country prior to deployment. In addition, seek the assistance of the U.S. embassies in each country to help with the customs issues associated with transporting blood and blood products across borders by ground or at sea and air ports of debarkation.

One example, during Saber Guardian in Romania, highlights the complexities of both military airlift and customs issues in Eastern Europe. During Saber Guardian (SG) blood did not arrive in time for the 212th CSH to have full operational capability (FOC) on the scheduled date of 7 July 2017. Two months prior to SG-17, the 212th CSH lab officer coordinated with the Armed Services Blood Bank Center - Europe (ASBBC-E) for 10 units of fresh frozen plasma (FFP) and 10 units of packed red blood cells (PRBC) to support the exercise. The 212th CSH was scheduled to have FOC by 7 July 2017. The lab officer was told that the shipment would ship directly to MK Airbase on 7JUL17. The ASBBC-E attempted to ship the blood via Military Air (MILAIR) on 7JUL17; however, there is only one MILAIR flight per month to Romania and it would occur after SG-17. The ASBBC-E decided to ship/fly the blood commercially on 10JUL17 and waited until this date to ship it. This is when ASBBC-E became aware that Romania had more stringent custom requirements for blood and it takes an average of two business days to process. The PRBCs arrived on 12 July 2017 and the FFPs arrived on 14 July 2017. Upon notification of the delay, the 212th CSH initiated a walking blood bank and pre-screened all of the non-medical / non-essential 212th CSH personnel. On 12 July 2017, the 212th CSH sent a request through 30th MED BDE for prescreening of available personnel on MK Airbase. On 14 July 2017, the 212th CSH was still awaiting assistance from 30th Medical Brigade and the request had yet to be formalized through an OPORD or FRAGO

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process. The 212th CSH initiated research of NATO blood screening protocols for partner nations.

A recommended solution is to implement protocols to confirm all country specific MILAIR schedules and country specific custom requirements for blood prior to deployment. In all theaters these custom requirements should be documented by Army Service Component Commands in the form of battle books for each country and provided to deploying units during their planning process. Further, deploying units must include this data in the medical concept of support and ensure the external coordination is accomplished. Finally, reinforce timelines for execution of the prescreening to prevent delays in availability of blood for mission.

Class V III (Blood)

Blood and blood products are more than just another commodity of medical supply. It is a living tissue requiring specific handling, movement and storage in order for it to maintain its life-sustaining properties. Execution of blood support in an operational theater, especially one as austere and distant as Africa is a dynamic process and requires continuous planning and “a coordinated, highly responsive system that extends from the continental United States to the battlefield”.¹ 1LT Proctor, the current Medical Logistics Section (MEDLOG) Officer-In-Charge (OIC) at Combined Joint Task Force-Horn of Africa (CJTF-HOA) Camp Lemonnier Djibouti (CLDJ) is very cognizant of the complexities of supporting blood supply requirements. Since his arrival in theater, he has studied the issues, identified gaps and has initiated the establishment of a blood support detachment in order to mitigate some of these shortfalls.

Shock from traumatic blood loss has always been recognized as a primary cause of death in war and the treatment of shock on the battlefield has been acknowledged since World War I.² A worsened outcome from using saline rather than blood in treatment of hemorrhagic shock has been noted as early as 1918.³

“Transfusion of blood after hemorrhage is a lifesaving intervention of the greatest value and enables urgent operations to be successfully performed under conditions otherwise hopeless”.

Robertson LB, Further Observations on the Results of Blood Transfusion in War Surgery. Annals of Surgery 1918; 67(1).

¹ Joint Chiefs of Staff, Joint Publication (JP) 4-02, *Joint Health Services*, (Washington, DC: Government Print Office, 2017); F-1.

² Fisher, Andrew D, Major, Miles, Ethan A., Major, Cap, Andrew P., LTC, Strandenes, Geir, CDR, Kane, Shawn, COL, *Tactical Damage Control Resuscitation*, Military Medicine, Vol 180 2015; 870.

³ Ibid.

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The use of saline versus blood for first-line treatment of hemorrhagic shock has alternated over the years and finally in 2014 the Committee on Tactical Combat Casualty Care (TCCC) removed saline as the favored fluid for hemorrhagic shock resuscitation.⁴ Currently TCCC protocol states if in shock and blood products are available:

- Resuscitate with whole blood, or, if not available
- Plasma, packed red blood cells (PRBCs) and platelets in a 1:1:1 ratio, or, if not available
- Plasma and PRBCs in a 1:1 ratio, or, if not available
- Reconstituted dried plasma, liquid plasma or thawed plasma alone or PRBCs alone.⁵

There are certain caveats to using fresh whole blood (FWB) and platelets; the products used should be collected and processed using FDA-compliant methods. Blood processing in theater is not FDA approved and CLDJ most likely will not receive such approval as a contingency location. FWB and platelets collected in theater should be used only if FDA-compliant blood products are not available⁶ hence, the gravity of maintaining sufficient FDA-compliant blood products in theater.

Blood and Blood Products (Class VIII/b).

All blood and blood products must be stored at strictly-regulated temperatures, either frozen, refrigerated, or at precise room temperature, depending on the product.

PRBCs. PRBCs are available in fresh (liquid) form or frozen. CJTF-HOA MEDLOG receives PRBCs in liquid form only. Fresh PRBCs must be refrigerated and have a refrigerated shelf life of 21-42 days, depending on the preservative used. Frozen PRBCs have a shelf life of ten years, due to the added glycerol which extends its shelf-life. It takes between two to four hours to deglycerolize, thaw and process for transfusion.⁷



⁴ Fisher, Andrew D, Major, Miles, Ethan A., Major, Cap, Andrew P., LTC, Strandenes, Geir, CDR, Kane, Shawn, COL, *Tactical Damage Control Resuscitation*, Military Medicine, Vol 180 2015; 870.

⁵ Tactical Combat Casualty Care Guidelines for Medical Personnel, 31 January, 2017.

⁶ Blood Centers of America, *Platelets*, <http://bca.coop/products-services/blood-products/platelets> (accessed 5 May 2018).

⁷ Yuan, Shan MD, *RBC Products: General Transfusion Indications*, 29 March 2011, <http://pathology.ucla.edu/workfiles/Education/Transfusion%20Medicine/6-1-RBC-Products-Gen-Indications-99214717.pdf> (accessed 21 April 2018).

Fresh Frozen Plasma (FFP). Liquid Plasma is transported and stored in fresh form, while FFP is transported frozen and then thawed prior to transfusion by the medical provider and staff. CJTF-HOA MEDLOG handles primarily frozen plasma however does have one customer who has a liquid plasma requirement.



Platelets. Platelets are a component of blood vital for clot formation. Once separated from whole blood they are very fragile; the specimens have to be kept at strict room temperature with continual agitation. Even with this process, platelets remain viable for only five days.⁸ Due to limited shelf life, the only platelets available in theater are those that would be extracted from FWB during activation of the walking blood bank. These platelets would be used only as a last resort because FDA-compliant processes are not available in this theater. Additionally, frozen platelets are not available for theater as they have yet to be an FDA approved product.

FWB. FWB must be used for transfusion within 24 hours after collection. FWB cannot be frozen in order to extend its shelf life. In the US and in mature theaters where FDA-approved processes exist, FWB is the first-line choice for hemorrhage shock resuscitation. However since those FDA-compliant procedures are not available in our theater, whole blood (and platelets) collected in the ARICOM theater “should be used only if all of the FDA-compliant blood products needed to support 1:1:1 resuscitation are not available, or if 1:1:1 resuscitation is not producing the desired clinical effect”.⁹

Blood Flow into Theater;

There are two Armed Services Whole Blood Processing Laboratories (ASWBPL) in the United States (US), ASWBPL-East (E) in New Jersey and ASWBPL-West (W) in California. These laboratories receive blood from designated blood donation centers throughout the US, where the blood is typed, screened, processed, stored and then shipped. The Joint Blood Program Office-Europe (JPBO-E)/Armed Services Blood Bank Europe (ASBBC-EUR) in Landstuhl, Germany serves as the overall blood manager for EUCOM and AFRICOM. ASWBPL-E ships blood and products to the JPBO-E/ASBBC-EUR every two weeks.¹⁰ however, issues with contracted logistical companies, confusion at transit points and delayed/cancel flights have extended the two weeks to three sometimes four weeks. The blood and products are subsequently shipped directly to the MEDLOG at CJTF-HOA at CLDJ. In times of stateside shortages, JPBO-E/ASBBC-EUR does collect, process, test and store.

At present, the CJTF-HOA MEDLOG section performs some of the roles of a Medical Detachment Blood Support (MDBS) without a fully supported MDBS Modified Table of

⁸ Blood Centers of America, *Platelets*, <http://bca.coop/products-services/blood-products/platelets> (accessed 5 May 2018).

⁹ Tactical Combat Casualty Care Guidelines for Medical Personnel, 31 January, 2017.

¹⁰ Ibsen, Leif, Major. US Army Africa Single Integrated Medical Logistics Manager Concept of Operations, 28 August 2017.

Organization & Equipment (MTOE).

An MDBS provides collection, manufacturing, storage and distribution of blood and blood products to supported units. The CJTF-HOA MEDLOG section receives blood products from JPBO-E/ASBBC-EUR for forward distribution to its five customers. The MEDLOG area on CLDJ has some freezer/refrigeration and storage capability, but not enough to store amounts necessary to maintain an adequate reserve supply in times of CONUS or JPBO-E/ASBBC-EUR blood bank shortages or during an increased operations tempo.



The CJTF-HOA MEDLOG Section provides Class VIII/b support to five customers, some physically located at CLDJ, others deployed forward. The supported units submit their blood product requirements to the CJTF-HOA Surgeon Cell, who then routes the requests to the Defense Health Agency (DHA) for approval. Once approved, JPBO-E /ASBBC-EUR ships weekly supplies to meet the supported units' monthly requirements. The arrival time for shipment from Europe to CLDJ averages three days, when all mechanisms of the process are in order. The Class VIII/b arrives at the Air Tactical Operations Center (ATOC), MEDLOG personnel pick up the delivery and temporarily store it at CJTF-HOA MEDLOG until supported units can pick up their supply. Usually the LNOs of supported units on CLDJ pick up their supply the same day as arrival, store it at their location utilizing local refrigeration/freezer capabilities before distributing it to their organizations in forward locations. The frequency of delivery and the amount of blood delivered to CLDJ however is dependent upon the supply to JPBO-E/ASBBC-EUR from CONUS and the amount available at JPBO-E/ASBBC-EUR. There were several times in 2017 as well as occasions in 2018 when customers' Class VIII/b supply on hand fell below minimal required quantities due to shortage of supply throughout CONUS, canceled/delayed MILAIR flights (competing requirements among aircraft), failures within the Europe-based contracted logistic company, and malfunctions of storage equipment and facilities.

Contingency Planning:



When planning for Class VIII/b support in theater, especially during contingency operations, the reaction time of the supporting blood centers, CONUS and in Europe must be considered. Ideally, the requesting command receives the ordered blood or blood products within 72 hours, but realistically a planner may expect a four to five-day (or longer) resupply response time from outside theater depending on availability of air transportation and location of the needs. To the maximum extent possible during operations, the responsible blood support personnel on ground should have a 100 percent replacement goal.¹¹

Golden Hour Containers (GHC) are available for storage and transport of blood, particularly during

contingency operations. GHC's improve the chances of survival by providing a supply of PRBCs and plasma for treatment at the point of injury on the battlefield during the crucial hour immediately following an injury, and when immediate evacuation to a treatment facility is unavailable. These containers are able to maintain blood storage temperatures for up to seven days and are available to all CJTF-HOA customers. Additionally pre-positioned frozen blood products in the CJTF-HOA area could offset shortages that occur during normal operations but would also ensure availability of blood products during the initial days of a contingency operation until the US blood system is fully activated.

Blood Detachment:

While support from an outside theater is an adequate short term solution (or possibly a long term solution for short term operations), theaters must establish permanent, on-ground blood support capabilities if a mission is enduring. 1LT Proctor recognized this and with the assistance of his soldiers, SSG Lopes and SGT Toohey, began the endeavor to achieve a more permanent state for blood support operations in the Combined Joint Operations Area (CJOA). He coordinated with AFRICOM to discuss establishing a blood detachment on CLDJ, collaborated with the JPBO-E/ASBCC-EUR Blood Director for equipment requirements and submitted purchase requests, requisitioned for two medical laboratory technicians (68K) through USARAF and coordinated with the Facilities Management Division (FMD) to discuss layout of equipment. Current status of the blood detachment project is as follows:

- Walk-through with FMD completed.
- Requested facility modifications approved.

¹¹ Joint Chiefs of Staff, Joint Publication (JP) 4-02, *Joint Health Services*, (Washington, DC: Government Print Office, 2017); F-11.

- Project design completed as of April 2017.
- Request for Construction Funds/Construction Phase ongoing.
- Construction Funds are expected to be approved NLT May 2018 with anticipated construction date of Aug/Sep 2018.
- All mission essential equipment has been purchased, 13 out of the 17 items have been received.
- USARAF is currently drafting Request for Forces to acquire two 68Ks – Army Lab techs. These personnel are essential to conduct the deglycerolization (thawing) process.

Once the blood detachment is in operation it will not have the capabilities of a full-scale MDBS, however will be able to:

- **Deglycerolize/thaw and wash frozen PRBCs for use.** Customers can thaw their own FFP using room temperature water or room temperature environment without water. However, frozen PRBC's must be thawed using a special centrifuge involving precise methods.
- **Receive frozen PRBCs.** Currently MEDLOG only receives fresh PRBCs. Since the detachment will have the specialized capability to thaw frozen PRBC's, this product will become part of CJTF-HOA's regular inventory. It will allow for longer shelf life (ten years) and can subsequently provide a more robust reserve supply.
- **Increase storage capacity.** The additional stationary equipment at CLDJ and increased numbers of mobile field/portable refrigerators will provide more than double the current storage capacity, both at CLDJ and at forward locations.

There will continue to be some constraints to blood operations in the CJOA despite the establishment of the blood detachment. The foremost issue is the loss of continued accountability of products once they are dispensed from CJTF-HOA MEDLOG



to the customers. A good reporting and inventory control system is crucial and is accomplished through a standardized blood reporting system. This enables the blood detachment to effectively manage blood, project blood requirements, request blood, report blood inventories, and provide information on the overall blood element operations of all Service components in the CJOA.¹² However, since the CJTF-HOA



¹² Joint Chiefs of Staff, Joint Publication (JP) 4-02, *Joint Health Services*, (Washington, DC: Government Print Office, 2017); F-13.

MEDLOG does not have an integrated automated logistics system enabling complete visibility of Class VIII items at JTF level, once the transfer of blood products is complete, MEDLOG will no longer have visibility and the onus of further distribution, usage, reporting and other activities regarding Class VIII/b is on the customer. This could be resolved by granting access to DMLSS at unit level and CJTF-HOA MEDLOG level. The "Tyranny of Distance" from CONUS will continue to pose a problem in getting blood to the CJOA. Flight routes directly from CONUS to AFRICOM/CLDJ do not currently exist, thus supply from CONUS will continue to rely on Europe as a transit point. Therefore, it will be paramount to continuously build and strengthen the blood detachment capabilities in order to prevent shortages and degradation of operations.

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