

Clinical Knowledge Advances Medical Logistics

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Abstract

Sept 11, 2001, was a date that changed the world forever and invoked the deepest personal commitment of US military members since Pearl Harbor and the subsequent US entrance into World War II. However there was a difference. America was horrified and outraged when they learned of the unprovoked attacks on US Forces in Pearl Harbor which resulted in America's Declaration of War and entrance into World War II. Sept 11th was more than an attack on US Forces; it was a cowardly attack on the very heart and values of America itself, and every other country that believes in and strives for freedom and democracy. It shook the very foundations of our lives and cast doubt on the security we as Americans felt living on our own soil, and once again plunged America into a war. A "War on Terrorism."

The words, "A War Like No Other" have been echoed by many of our senior leaders in the political and defense arenas. The media has repeatedly aired stories of how our men and women in uniform are breaking new ground in efforts to support the war on terrorism. Medical Logistics was no different in that aspect.

1. Background

The U.S. Army Medical Materiel Center Europe (USAMMCE) is a unique organization and is the only one of its kind in the Department of Defense. It closely resembles commercial medical materiel distribution centers used throughout the U.S. and operated by companies such as Owens & Minor, Cardinal Health, and Allegiance Health Products. Its main work force consists of 269 Local National Civilians, 43 U.S. Civilians, 36 Army, 7 Air Force, and 3 Navy Active Duty personnel. The core competencies of USAMMCE are: acquisition, storage and distribution of medical materiel, clinical engineering support, optical fabrication, assembly, reconstitution, and disassembly of medical sets, kits and outfits (also known as "Kitting"). USAMMCE supports over

1,500 customer units located throughout Europe, Southwest Asia, South Central Asia, Africa, and Embassies throughout the world.

In response to the global war on terrorism, USAMMCE's customer base increased dramatically since September 11, 2001, from approximately 700 customer units to over 1,500. Along with this increase came a growing number of requests for new, and sometimes unique, product lines. In some cases the requests were for products that were neither new nor unique, but simply never previously stocked at USAMMCE due to low demand. All requests first had to be compared to any on-hand stock to determine if an equitable item was already stocked, or if the item would require vendor sourcing in order to be purchased for the customer as quick as possible.

As a result of the global war on terrorism, many vendors were, and still are, overwhelmed with the number and size of orders placed for particular product lines. The inability to fill the quantities ordered often results in an indefinite backorder from the manufacturer. As more and more customers continue to order products that are on backorder, the list of products due to the customer continues to grow and age. Additional concerns arise because many of the products require special handling in the form of cold-chain management, or require expeditious transportation due to uniquely short shelf lives, as with some laboratory reagents.

The obvious conclusion was that USAMMCE embark on a new stage of growth, which required a great deal of product line expertise. This was not a new concept to USAMMCE as an organization. According to Major Jorge Carrillo, Staff Pharmacist, in 1988 USAMMCE identified the need to have in-house pharmaceutical expertise to help identify pharmaceutical substitutions and to help the customer base with clinical decisions in the Pharmacy and Therapeutics arena (Personal Interview, July 22,2004). An active duty Army Pharmacist position was immediately established under Materiel Management, which has proven to be invaluable to USAMMCE and it's customers. Based on the new challenges facing USAMMCE and past successes with integrating clinical expertise with the logistics system, the decision was made to establish a new

division with the clinical expertise required to meet the new challenges and to better serve the customer base. This new Division was named the Clinical Advisory Support Division (CAS-D).

2. Methodology

USAMMCE already had a foundation of clinical support through use of the Army Active Duty Pharmacist, and an Active Duty Navy Pharmacy Technician. The Pharmacist was therefore tasked to head up the new division and to determine what clinical expertise would be required as in-house staff, and what clinical expertise would be required on an adhoc basis.

The methodology used was based on a complete breakdown and analysis of the product lines that were cataloged and stocked, and how they related to overall customer demand (Carrillo, 2003). The PIE charts below indicate a summary of the analysis conducted. Chart (1) reflects the breakdown of the items that are cataloged for purchase through USAMMCE. Chart (2) reflects the product line breakdown of items that are cataloged and carried as on-hand stock at USAMMCE. Chart (3) reflects the overall relationship of the customer demand, based on sales, and was narrowed down to reflect the primary sales in relationship between pharmaceutical lines and all others (which encompasses all med/surg, dental, laboratory, equipment, etc.).

Clinical Products Overview

Number of Line Items - Cataloged

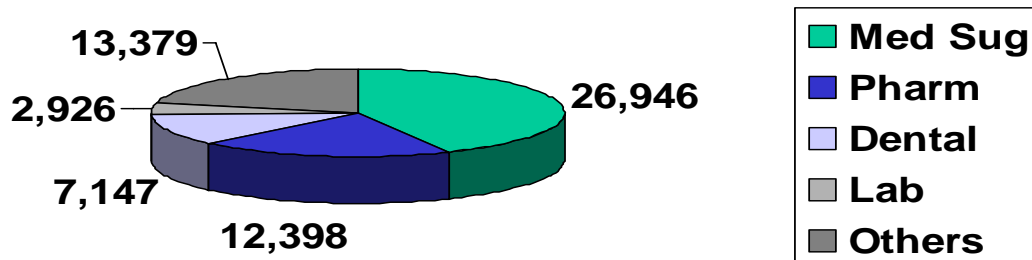


Chart (1)

Clinical Products Overview

Number of Line Items - Stocked

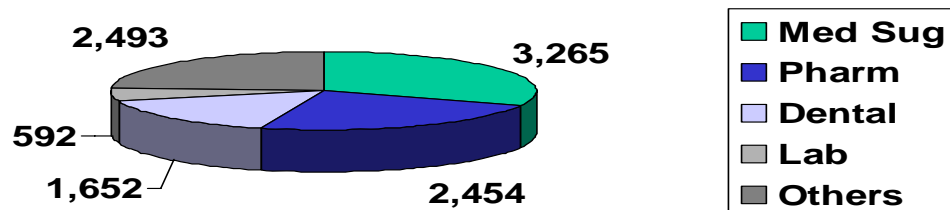


Chart (2)

USAMMCE Sales Overview

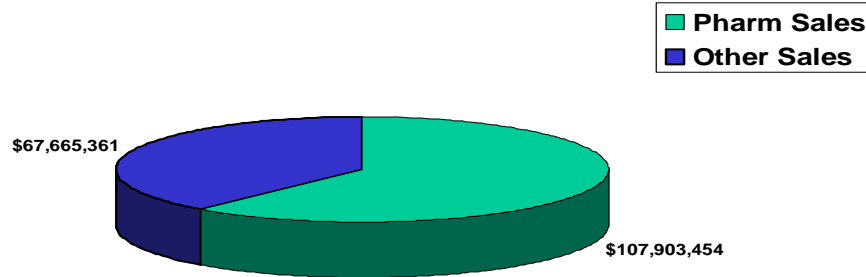


Chart (3)

Upon completion of the breakdown analysis, the CAS-Division Chief, Major Jorge Carrillo, US Army, Medical Service Corps, presented the results to the Executive Steering Committee and laid out what he saw as the objectives for the newly formed division (Carrillo, 2003). The objectives presented were as follows;

- Develop systematic processes to evaluate all issues related to medical supplies
- Ensure availability of medical supplies by identifying proper substitutions for unavailable products
- Identify cost-effective substitutions for medical supplies whenever possible
- Assist in identifying most convenient source of supply to improve the procurement of materiel
- Assist customers with specialty-specific issues, and improve communications
- Improve standardization of nomenclature/item descriptions in automated logistics systems
- Assist with the identification of products in the New Item Request Process

- Manage all specialty-specific programs and/or projects
- USAMMCE Program Manager for Military Vaccine (MILVAX) Program
- Cold-Chain Management
- USAMMCE POC for Expired Drug Returns, Joint Deployment Formulary, Investigational Drugs, DoD/FDA Shelf Life Extension Program (SLEP), and ERMC Standardization Committee.

Based on the product analysis and the operational objectives, MAJ Carrillo recommended that USAMMCE staff the CAS-D with the following personnel (one each)

- Pharmacy Officer (Division Chief)
- Pharmacy Technician
- Registered Nurse
- Laboratory Technician
- Logistics Technician and or Prime Vendor Representative
- Dental Technician
- Veterinary Technician (external consultant)

The staffing recommended would give USAMMCE clinical consulting coverage on 79% of all product lines (Carrillo, 2003). The recommendations were approved and hiring actions initiated for the beginning of Fiscal Year 04 (October 1, 2003).

USAMMCE currently utilizes Owens & Minor as their Med/Surg Prime Vendor. Due to the volume associated with USAMMCE's orders to the prime vendor, Owens & Minor agreed to assign a permanent in-house representative to assist with product identification and product availability. In

addition to the recommended staffing, the CAS-D staff was augmented with the in-house Owens & Minor Prime Vendor representative, who complemented the overall clinical expertise they were trying to establish. Currently the CAS-D is comprised of One Pharmacist, who also functions as the Division Chief, One Navy Pharmacy Technician, One Nurse Clinical Analyst, (with a strong Med/Surg background), one active duty Laboratory Technician (temporarily assigned from another Army unit), the Owens & Minor Med/Surg representative, and outstanding hiring actions to bring on one civilian Laboratory Technician and a civilian Dental technician.

3. Issues

Perhaps the most important organizational premise was that the staff hired to develop the CAS-D would need to have very specific backgrounds as well as the potential not just to learn and use the automated logistic system, but to master it in order to track orders, stock record files, and to be able to research product from every aspect of the logistics system. The Nurse Analyst would have to have a strong Med/Surg background which meant he/she would have to have significant OR experience in order to recommend possible Med/Surg substitutes to fellow clinicians. The CAS-D staff would also have to market themselves to the USAMMCE Item Managers and build a level of trust in their abilities and judgment to advise the Item Managers on products that should and should not be stocked at USAMMCE, as well as build a strong rapport with the clinicians and logisticians in the customer base. The Pharmaceutical line demonstrated an obvious advantage in acceptance of consultation and recommended changes from the Pharmacist, since he was recognized as an institutional norm after 15 years of integration. Additionally, every Pharmacist assigned to USAMMCE was required to become very knowledgeable of the logistics system, including procurement procedures and warehousing protocols. This allowed him to develop strong professional relationships with the non-clinical staff.

Another issue is that of inter-divisional relationships. The CAS-D consultation crosses virtually every divisional line, from dealing directly with customers to recommending or establishing storage and handling protocols for sensitive products. Just as the Customer Support Division is authorized to cross divisional lines to ensure that customers needs/issues are met and or resolved, so too must the CAS-D staff be granted the same authorization. This authorization grants legitimacy and leadership support to the concept of advancing medical logistics through the use of clinical knowledge, hopefully advancing the integration of the new division and staff members into the overall organization.

A major issue with starting any new division and increasing the size of the staff is supporting resources. Physical space, operating budget, and payroll are major concerns. Any new starts

must be weighed out against the total benefit, not only to the organization, but to the customer as well. In the Pharmaceutical arena it has been a long-standing practice to form Pharmacy and Therapeutics Boards/Committees whose input helps determine the most effective, yet cost efficient formularies that will best benefit the patient population, as well as the hospital's bottom line. Clinical Advisory Boards have also proven to help guide and improve the successful outcomes of various clinical procedures. The transition to using the same base methodology to help determine possible product substitutes that give the same or better clinical results and help in determining cost efficiencies may run afoul of the old "clinician verses administration" stereotypes, but the relationship between the two is actually a natural, common-sense relationship that can result in great benefits to the organization and to the customer.

4. Benefits

USAMMCE faced many problems -- a growing aged due out list because of manufacture back orders, an increasing order cancellation rate due to discontinuation of products without identified substitutions, and an increase in cataloging errors associated with issues ranging from nomenclature/proper product description to ratio conversions for pharmaceutical substitutions, and a host of difficulties in between. The upfront benefit was overwhelmingly clear...If USAMMCE could overcome the lack of clinical expertise required to identify adequate substitutions, to clearly and clinically identify/describe products in the catalog, and ensure clinical accuracy of ratio conversions and product utilization, then backorders would decrease, order ship time to the end customer would decrease, communication and understanding from the customer's prospective would increase, and USAMMCE would be better able to carry out its mission and encourage higher sales to the customer base through improved customer confidence. Additionally, by identifying more cost-efficient substitutes for items carried as on-hand stock, there was a potential for large cost savings and/or cost avoidances for the customer as well as USAMMCE.

5. Evidence of success

Under the new role as the Chief of the Clinical Advisory Support, MAJ Carrillo turned his focus from reactive customer assistance to proactive customer assistance by quickly identifying numerous pharmaceutical substitutions for cost savings and product availability, reducing the quantity of aged due outs (Personal Interview, July 22, 2004). Once the clinical nurse was fully engaged in the CAS-D functions, the same focus was initiated with the Med/Surg product line, and with the assistance of the Prime Vendor Representative, product standardization possibilities and product substitutes were identified and incorporated in to the USAMMCE catalog. The following demonstrates the level of success to date.

a. Pharmaceuticals

(1) Medical Material Availability

Identified viable substitutions for pharmaceutical items on zero balance and posted the substitutions on the USAMMCE Webpage, as well as releasing the information in a group e-mail to customer pharmacies.

The CAS-D has identified 160 Substitution Actions since Oct 03 (Carrillo & Wheeler, 2004)

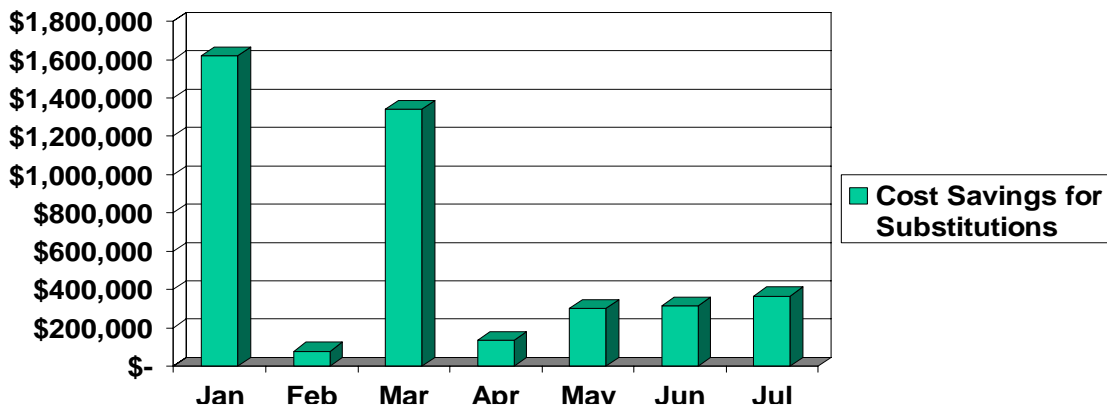
- 80 Automatic substitutions (Bio-equivalents)
- 50 Possible substitutions (non bio-equivalents, viable substitute if the customer wishes to use it)
- 30 No substitutions (unique items with no substitute available, allowing the customer to re-evaluate requirements)

(2) Cost-Effective Substitutions

MAJ Carrillo states that one of the methods used to find cost-effective substitutions was to review national contracts to see if items were being offered at a lower price through other Federal contracts. During this process CAS-D identified 84 medications on VA/DoD national

contracts that had better pricing and/or guaranteed availability. These items were identified in the USAMMCE catalog and made available to the customer base (Personal Interview, July 22, 2004). Additionally, the CAS-D developed an automated system that notifies the division of price changes in excess of 10%, signaling an investigation into the price change and a search for possible alternative sources. These action and program implementations have led to the following preliminary cost savings. Chart (4), demonstrates estimated cost savings, based on the cost-effective substitute being ordered instead of the more expensive item, in the previous-year quantities. Chart (5) demonstrates that 71% of the estimated cost saving are related to the top six (6) classes of targeted substitutes.

Pharmaceutical Cost-Savings (Estimated)



Total Annualized Projected Savings \$3.793 million

Projection based on substitute item being ordered in same qty as previous year

Chart (4)

Pharmaceutical Cost-Savings

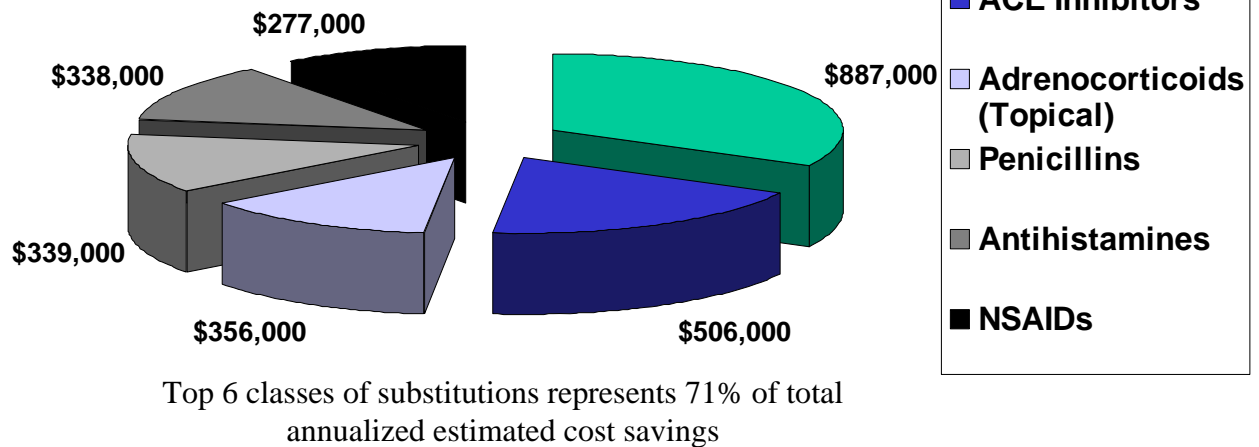


Chart (5)

(3) Reduction in Aged Due Outs

Product substitutions have also led to a 25% reduction in aged requisitions by:

- Monitoring and identifying aged requisitions.
- Prioritizing and releasing materiel based on age and urgency.
- Identifying viable clinical substitutions and offering the information to the customer, allowing for product choice.
- Assisting with follow-up process by contacting manufacturers for backorder status.

(4) Increased Communication with Customer

The CAS-D has dramatically benefited the customer base by increasing communication through publication of USAMMCE Pharmacy Notes, distributed to customers via e-mail and posted on the USAMMCE CASD Webpage, and by accompanying Customer

Division personnel on customer assist visits, providing clinician-to-clinician contact. The Pharmacy Notes give a detailed listing of problematic items and recommended substitutes associated with them.

(5) Enhanced Cold-Chain Management

The CAS-D has modernized and assumed responsibility for the Cold-Chain Management Program, providing medication stability information and assisting the customer in determining the viability of the product in the event cold-chain management protocols have been breeched. Through introduction of the newest in Temptale® technology, strict handling protocols, and clinical consultation services with the Pharmacist, cold-chain related reports of discrepancies have declined by 65% (Carrillo & Wheeler, 2004). The Cold-Chain Management Program has also led to the development of a centralized USAMMCE Military Vaccine Program (MILVAX) to support customers in the European and South Central Asia areas. To date this program has managed the distribution and oversight of over 50,000 vials (500,000 doses) of influenza vaccine for the 2004 season, and has already received customer requirements (49,701 vials) for the 2005 season. CAS-D also acts as the central distribution and release authority for anthrax and smallpox vaccines in the European Theater. In order to assist customers in vaccine requests, the CAS-D developed and implemented a Standardize Ordering Process via electronic MILVAX request forms over a secure-server website, simplifying the overall process for the customer.

b. Medical Surgical Product Successes

(1) Source of Supply Conversion

By converting the source of supply from the Defense Supply Center in Philadelphia (DSCP) to commercial prime vendors and local sources utilizing the Government Credit Card,

USAMMCE realized a \$270,000 cost avoidance for over 250 line items from Oct 03 to Jan 04 alone (Carrillo & Wheeler, 2004).

To date, the team has been able to standardized over 500 nomenclature descriptions in the USAMMCE automated logistics system, decreasing order errors on behalf of the customer by giving them a clear, concise item description. The direct result is improved customer satisfaction (Customer Survey, 2004 and Personal Interview, 2004).

(2) Med/Surg Cost-Effective Substitutions

Although still in its infancy, the CAS-D has slowly began to target Med/Surg cost-effective substitutions in hopes of producing the same type of results as experienced in the pharmaceutical lines. From March through June of 2004, the Nurse Analyst has been able to identify cost-effective substitutions for 37 lines of Med/Surg products that is estimated to yield a cost savings of \$109,000 through the end of this fiscal year (Carrillo & Wheeler, 2004). As the new division establishes itself and all approved personnel are hired, it is expected that the cost-effective substitutions will be a high point with respect to cost savings. Current analysis demonstrates beyond any doubt that the success of adding clinical expertise/input directly to the medical logistics system can be measured in not only dollars (just under \$4.2 million in potential savings), but in customer satisfaction that comes from increased communications, product availability, and overall pricing benefits.

6. Reflections

Before the introduction of the Clinical Advisory Support Division, clinical input for medical logistics or materiel management decisions was limited. Although USAMMCE had a Pharmacist on staff that was recognized as a valuable asset, his duties and input were limited to a more reactive role of assisting the customers. Since recognizing the need for more robust and proactive clinical input, USAMMCE has invested resources in developing a functional Clinical Advisory Support Division, developed and run by a clinician and staffed primarily with personnel possessing clinical skills. The results, although preliminary at this point, demonstrate unlimited potential for tangible

benefits such as cost savings, cost avoidance, and better inventory management practices such as product substitutions and product viability through cold-chain management. In addition to the tangible benefits, intangible benefits are also being realized through increased communications with clinicians by the customer base, and creating a comfort zone for clinicians by allowing them to talk with a consultant on the same relative level of clinical experience and knowledge. The CAS-D has also increased product choices for the customer, hopefully decreasing wait times for products on backorder. Ultimately, that should result in a large boost to customer confidence, thereby strengthening relations between the customer and USAMMCE.

Adding the Clinical Advisory Support division to USAMMCE has, without a doubt, added new business processes to the organization and advanced the logistics-based system in ways that are yet to be completely measured. When your customer base is primarily driven by clinical demands, it makes sense to have the appropriate staff in-house to ensure that you are properly interpreting and meeting the customer's demands and/or intent. These efforts lead to the point where you can actually anticipate demands, and thereby exceed your customer's expectations.

8. References

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