Wounded Warrior
Medical Information Management from the Battlefield to Home

COL Claude Hines, Jr., MS, USA, Program Manager
April 5, 2008
**Wounded Warrior. Medical Information Management from the Battlefield to Home**

**Theater Medical Information Program-Joint (TMIP-J), Department of Defense, Washington, DC, 20301**

**Army Telemedicine Partnerships Series 2008: Personal Health Monitoring?, Seattle, WA, 5 Apr 2008**
Theater Medical Information Program-Joint (TMIP-J) Mission

- Theater input to the Military member’s longitudinal electronic health record
- Medical component of Global Combat Support System (GCSS) and Global Command and Control System (GCCS)
- Enable theater patient visibility
- Provide automated tools for the aggregation of medical data to support medical situational awareness and surveillance
- Provide automated theater logistical and blood management tools
- Facilitate movement of pertinent theater medical data to DoD and Service-specific systems or databases
Theater Operational View OV-1
Theater Complement to MHS

**Sustaining Base**
- Longitudinal Electronic Health Record (EHR)
- Robust communications infrastructure
- Medical Logistics
- Environmental Health
- Other sustaining base systems
- Large footprint

**Theater**
- Operates in austere communications environments
- Portable and modular
- One system of record
  - Provides theater clinical data to the Military member’s longitudinal EHR
  - Medical Surveillance
  - Medical Logistics
  - Patient Movement and Visibility
Service Infrastructure Program Offices

CONOPS
Hardware
Communications Infrastructure
Fielding/Training
Current Clinical Capabilities (Block 1)

AHLTA Mobile
Version 1.9.8
- First Responder Application
- Electronic Field Medical Card

TMIP CHCS Caché (TC2)
Version 1.0.0.0
- Inpatient Treatment Documentation
- Pharmacy, Laboratory, and Radiology Support

AHLTA Theater
Version 301.3
- Outpatient Treatment Documentation

Joint Medical Work Station (JMeWS)
Version 2.2.3.4
- Command and Control
- Medical Surveillance
- Classified

Theater Medical Data Store (TMDS)
Version 2.2.3.4
- Individual Theater Medical Encounters
- Bidirectional Health Information Exchange (BHIE)- Interface
- Unclassified
Current Logistics Capabilities in Theater

**DMLSS Customer Assistance Module (DCAM) Version 1.1.39.0**

- Stand alone MEDLOG application that enables users to electronically download catalog data, place orders, and obtain status information from their supply activity
  - Can be used by all medical personnel
- Operates in austere communication environments
- Capability to feed data to Joint Medical Asset Repository (JMAR)

**Patient Movement Item Tracking System (PMITS) PlexusD Version 1.0.2.0**

- Tracks air certifiable medical equipment evacuated with the patient
- Facilitates the management and distribution of PMI assets
- Stand-alone application which requires a modem to communicate
- Utilizes bar-coding and scanning technologies
TMIP Inpatient Data

TC2 Statistics
(1 June 07 - 31 Jan 08)
1,238,204 Total Workload

Note:
CHCS NT Statistics
(1 Apr 05 - 15 Jul 07)
1,836,580 Total Workload
Outpatient Statistics
(1 Jan 05 – 31 Jan 08)
1,545,122 Total Encounters

- AHLTA-T: 1,230,902
- SAMS: 203,903
- GEMS: 110,317
Recent Upgrades and Enhancements

» TMIP CHCS CACHE (TC2) Interface with TMDS
» BHIE-T Interface with TMDS
» TRAC2ES Interface with TMDS
» JPTA/TMDS Merge
Technical refresh of CHCS-NT to TC2

Uses Health Level 7 (HL7) messages to move clinical inpatient data from TC2 to TMDS including:

- Discharge summaries, doctor/nursing/operative/progress notes
- Admissions, discharges, transfers
- Dietetics, allergies, inpatient medications
- Laboratory orders and results
- Radiological orders and radiologist’s report
- Additionally - Outpatient ancillary services (Pharm, Lab, Rad)

Activated 1 August 2007
Bi-directional Health Information Exchange - Theater (BHIE-T) Interface with TMDS

» VA providers can access theater clinical data for DoD patients who transfer to the VA for care or evaluation

» BHIE-T activated on 6 October 2007 with over 255,000 Active Duty, National Guard, and Reservists (FMP 20) patients’ demographic information
  ▫ Of the 255,000 patients 49,700 were registered with the VA
  ▫ TMDS updates BHIE-T with new FMP 20 patient registrations every 2 hours

» BHIE-T facilitates the sharing of patient information available in TMDS to VA providers and DoD Secure Heath Alliance Record Exchange (SHARE) sites
TRAC2ES Interface with TMDS

» Facilitates the exchange of patient clinical information from TMDS to TRAC2ES and patient movement data from TRAC2ES to TMDS

» Enables TRAC2ES to retrieve data from TMDS to populate fields in a Patient Movement Request (PMR)
  ▫ Demographic data, vital signs, allergies, laboratory results, diagnosis, and objective patient history

» Enables TMDS to receive In-transit Visibility (ITV) data provided by TRAC2ES
  ▫ Patient movement (origin, designation and time of movement), flight readiness (mission ID and aircraft type), itinerary and special equipment needs

» Activated 21 December 2007
Joint Patient Tracking Application (JPTA) Merge into TMDS

» Initiative to merge JPTA into TMDS
  ▫ Similar “look and feel” and base functionality
  ▫ Allows authorized users to view patient data from theater clinical systems (AHLTA Theater, AHLTA Mobile, GEMS, SAMS and TC2)
  ▫ Provides theater patient visibility and tracking
    • TRAC2ES Patient Movement Request (PMR)
  ▫ One theater database

» Data interfaces
  ▫ CHCS Patient Data Import (visibility of SI and VSI patients)
  ▫ DEERS
  ▫ Veterans Tracking Application (VTA)
  ▫ DFAS (combat injury pay)
  ▫ Medical Operational Data System (MODS)

» Go live date – 1 March 2008
Conduct a Patient Search for Kenny McCormick by entering last name in the Search Name field.

Patient Search Displays Patient Data from:
- AHLTA-T
- TC2
- JPTA
- TRAC2ES

Patient Information:
- PATIENT NAME: MCCORMICK, KENNY
- PATIENT SSN: *****3456
- INITIAL DIAGNOSIS: Other suppurative peritonitis. Abscess (of): abdominopelvic, mesenteric,

Other Treatment Data
Show Additional Treatment Data

Tracking Status:
- Author: fms
- DATE: 11/08/2007 09:58
- NOTES: [Unavailable, please download to view]

Location History:
- Status: UNDEFINED
  - Data Source: TRAC2ES
  - Location: UNKNOWN
  - Date: 11/09/2007 17:30
  - Facility: WALTER REED AMC-WASHINGTON DC(W2DHAA)
- Status: INPATIENT
  - Data Source: JPTA
  - Location: PENDING
  - Date: 11/08/2007 16:03
  - Facility: Landstuhl RMC(W1HHA)
- Status: ADMISSION
  - Data Source: CHCSTC2
  - Location: UNKNOWN
  - Date: 11/06/2007 10:00
  - Facility: 0086 MD HSP CBT SPT HOSP(WD5TAA)
- Status: ADMISSION
  - Data Source: CHCSIIT
  - Location: UNKNOWN
  - Date: 11/05/2007 12:28
  - Facility: 0086 MD HSP CBT SPT HOSP(WD5TAA)
<table>
<thead>
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<th>Status</th>
<th>Data Source</th>
<th>Location</th>
<th>Date</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDEFINED</td>
<td>TRACZES</td>
<td>UNKNOWN</td>
<td>11/09/2007 17:30</td>
<td>WALTER</td>
</tr>
<tr>
<td>INPATIENT</td>
<td>JPTA</td>
<td>PENDING</td>
<td>11/08/2007 16:03</td>
<td>Landsturn</td>
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<tr>
<td>ADMISSION</td>
<td>CHCSST2</td>
<td>UNKNOWN</td>
<td>11/06/2007 10:00</td>
<td>0086 MD HSP CBT SPT HOSP (WDSTAA)</td>
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<td></td>
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<td></td>
<td>11/05/2007 12:28</td>
<td>0086 MD HSP CBT SPT HOSP (WDSTAA)</td>
</tr>
</tbody>
</table>

**Movement Record**

**EXPAND ALL COLLAPSE ALL**

**Demographics Information**

- Last Name: MCCORMICK
- First Name: KENNY
- Middle Name: A11
- Rank: SSG
- Service: USA
- DOB: 10/21/1981
- Race: OTHER
- Gender: F
- Home Unit: UNKNOWN (55555)
- Deploy Unit: UNKNOWN (55555)
- Kin Information:
- Kin Name: null
- Patient SSN: 456789
- Sponsor SSN: 456789

**Movement Information**

- Status: COMPLETED
- Precedence: ROUTINE
- Date: 11/08/2007 00:00
- Originating Facility: 85TH MED GPN FAIMSTEIN AB GE (FS5600)
- Originating Theater: EUCOM
- Destination Facility: WALTER REED AMC-WASHINGTON DC (W29HAA)
- Destination Theater: NORTHCOM
- Last Known Location: WALTER REED AMC-WASH DC
- Last Known Location Date: 11/08/2007 00:00

**Inpatient Record**

**EXPAND ALL COLLAPSE ALL**

**Demographics Information**

- Last Name: MCCORMICK
- First Name: KENNY
- Middle Name: A11
- Rank: SSG
- Service: USA
- DOB: 10/21/1981
- Race: OTHER
- Gender: F
- Home Unit: UNKNOWN (55555)
- Deploy Unit: UNKNOWN (55555)
- Kin Information:
- Kin Name: null
- Patient SSN: 456789
- Sponsor SSN: 456789

**Encounter Information**

- Encouter Date: 11/09/2007 10:00
- Report Date: 11/06/2007 10:00
- Facility: 0086 MD HSP CBT SPT HOSP (WDSTAA)
- Data Source: CHCSST2

**Outpatient Record**

**EXPAND ALL COLLAPSE ALL**

**Demographics Information**

- Last Name: MCCORMICK
- First Name: KENNY
- Middle Name: A11
- Rank: SSG
- Service: USA
- DOB: 10/21/1981
- Race: UNKNOWN
- Religion: American Baptist Association
- Jumping Status: N
- VIP Type: N
- MP Status: N
- Diving Status: N
- Submarine Status: N
- Home Unit: UNKNOWN (55555)
- Deploy Unit: UNKNOWN (55555)

**Allergies Information**

- Start Date: 11/05/2007 12:28
- Allergy: No Allergies Found

**AHLTA-T Patient Encounter Record**

**TC2 Patient Encounter Record**

**JPTA Patient Encounter Record**

**TRACZES Patient Movement Record**

Select date links to view detailed patient information from each data source.
Progress Notes

11/06/2007 10:27  DOCTORS NOTE
HEAD: PT CAME IN WITH A C-COLLAR; SUPERFICIAL LACERATION TO THE FOREHEAD ABOVE EYEBROW AND TEMPLE.
CHEST: GSW LEFT SIDE BETWEEN NIPPLE AND ARMPIT THROUGH AND THROUGH; PT BROUGHT IN WITH FRONTIERNER OCCLUSIVE DRESSING THAT WAS REPLACED WITH ASCHERMAN CHEST SEAL IMMEDIATELY TREATED FOR TENSION PNEUMOTHORAX LEFT SIDE WITH 18 GUAGE NEEDLE; EXIT WOUND LEFT SCAPULA REGION TREATED WITH BANDAGE. SUPERFICIAL LACERATION TO RIGHT TRAP: BANDAGED W/4X4 AND TAPE. LACERATION SUPERFICIAL, RIGHT SHOULDER TISSUE INJURY IV LEFT ARM BASILIC VEIN; ADMINISTERED 1G ANCEF IN IV; NEEDS TD SHOT

11/06/2007 10:25  ADMISSION NOTE
GUNSHOT WOUND TO THE THORAX. SHRAPNEL WOUNDS; INJURY FROM FRAGMENTS FROM TERRORIST EXPLOSION.

Laboratory Results

11/06/2007 10:02  GLUCOSE
Procedure Description
GLUCOSE; QUANTITATIVE, BLOOD
Results
Name | Results | Ref. Range | Status | Certified By | Certified Date
-----|---------|------------|--------|--------------|----------------
GLUCOSE | 156 H | 73-118 mg/dl | Final Results | ADMIN, MCFOUR | 11/08/2007 10:13

Radiology Result

11/06/2007 10:40  CHEST, PA/LAT
RAD Information
Imaging Type: RADIOLOGY
Exam Status: PRELIMINARY
Exam Performing: RADIOLOGY ROOM
Transcription Date: 11/06/2007 10:41
Transcription Report Status: PD
Transcription Approved by: MCFOUR, ADMIN
Comments: MAJOR ABNORMALITY, PHYSICIAN AWARE
SHRAPNEL IN CHEST BETWEEN LEFT NIPPLE AND LEFT ARMPIT

Medications

11/06/2007 10:20  INPATIENT MEDICATION
Medication Name: CEFAZOLIN--INJ 1GM SOLR
Alt Medication Name: CEFAZOLIN SODIUM (ANCEF) 1G INJECTION VIAL
Medication Route: INJ
Requested AMT: 1 GM
Instructions to Pharmacy: Q6H

11/06/2007 10:17  INPATIENT MEDICATION
Medication Name: SODIUM CHLORIDE--IV 0.9% SOLN
Medication Route: IV
Requested AMT: 1 ML
Instructions to Pharmacy: ONE TIME
Theater Medical Data Integration (TMDI)

- GCSS
- JMeWS
- BHIE-T
- VA
- TMDS
- CDR
- JTTR

- Theater clinical data in TMDS accessible by VA and MHS
- Patient tracking & in-transit visibility data
- Trauma Data (planned)
- All theater outpatient and inpatient clinical data viewable (Summer 2008)

System Components:
- AHLTA Mobile
- AHLTA Theater
- GEMS
- SAMS
- AHLTA Mobile and AHLTA Theater outpatient encounters sent to the CDR
- TMIP CHCS Caché (TC2)
- Outpatient and Inpatient clinical notes and PLX data sent to the TMDS
- TRAC2ES
- JPTA Web Entry
- JPTA
## Block 2 Release FY07 (formerly B2R1)

<table>
<thead>
<tr>
<th>Originaly Planned:</th>
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<tbody>
<tr>
<td>✓ AHLTA Mobile 1.9.8*</td>
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<tr>
<td>✓ AHLTA Theater 301.9*</td>
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<tr>
<td>✓ Joint Medical Work Station (JMeWS) 2.2.3.4*</td>
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<tr>
<td>✓ Business Objects (Ad Hoc Reporting) 6.5.1</td>
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<tr>
<td>* Newer Version Than Planned</td>
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<table>
<thead>
<tr>
<th>Development Added to Block 1:</th>
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<tr>
<td>✓ TMIP Composite Health Care System Caché (TC2) 1.0.0.0</td>
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<tr>
<td>✓ DMLSS Customer Assistance Module (DCAM) 1.1.106.0</td>
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<tr>
<td>✓ TRANSCOM Regulating and Command &amp; Control Evacuation System (TRAC2ES) Interface</td>
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<table>
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<tr>
<th>Other Products:</th>
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<tr>
<td>✓ Patient Movement Items Tracking System (PMITS) 1.0.2.0</td>
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<tr>
<td>✓ Shipboard Non-tactical Automated Data Processing Program (SNAP) Automated Medical System (SAMS) 9.02.00</td>
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</table>

**Environment:** Windows XP Professional/Server 2003 Oracle 10g

**Sustain Block 1 until the Services migrate to Block 2**

**Released to Service Infrastructure Program Offices October 2006**

**OT completed 5 February 2008**
Block 2 Release FY07 Highlights

» AHLTA Theater
  ▫ Alternate Input Methods (AIMS) Forms
    • Includes 111 standard templates
  ▫ MACE Forms
  ▫ SAMS demographic interface
  ▫ Limited inpatient capability for Forward Resuscitative (Level II)
  ▫ Off-line demographic verification

» AHLTA Warrior (Phase 2)
  ▫ Reach back to the CDR for Patient History
    • Clinical Encounter
    • Allergies
    • Laboratory
    • Radiology
    • Pharmacy
  ▫ Single Sign On (SSO) with TMDS
    • Eliminates multiple passwords
    • Reduces multiple login screens to one
Near Term Initiatives

» TC2
  ▫ Improve usability by replacing a DOS like interface with a user friendly Graphical User Interface (GUI)
  ▫ Remote access for outlying Theater medical facilities
    • Allows providers to leverage clinical capabilities from off-site locations
  ▫ Improved interoperability between Theater hospital systems
    • Laboratory
    • Radiology
    • Consultations

» Clinical Context Management
  ▫ Automatically references the same patient across multiple applications
  ▫ Extends Single Sign On across the TMIP Suite of software

» Neuro-Cognitive Assessment Tool
  ▫ Conduct an Analysis of Alternatives (AoA) to identify the best technology to support Psychological Health and Traumatic Brain Injury
**TC2 Graphical User Interface Enhancement**

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**Personal Data - Privacy Act of 1974 (PL 93-579)**

<table>
<thead>
<tr>
<th>Patient Name/Address</th>
<th>FMP/SSN</th>
<th>Primary Care Manager</th>
<th>Age/DOB/Gender</th>
<th>Phone #</th>
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<tbody>
<tr>
<td>CDR Robert Green</td>
<td>20/012-34-1234</td>
<td>PCM Name:</td>
<td>Age: 46</td>
<td>(h): 201-343-1234</td>
</tr>
<tr>
<td>123 West Lake Rd.</td>
<td></td>
<td>PCM Dates:</td>
<td>DOB: 07-Dec55</td>
<td>(w):</td>
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<tr>
<td>Washington, District of Columbia</td>
<td></td>
<td>PCM Clinic:</td>
<td>Gender: M</td>
<td>Sponsor:</td>
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<tr>
<td>2001</td>
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</table>

**Allergies**
1) Penicillin
2) Aspirin
3) Haldol

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**Patient Lookup**

- Enter Patient Information
- Search

---

**Patient Data**

- Summary
- Labs
- Radiology
- Diagnoses
- Procedures
- Medications
- Admissions
- Appointments
- Immunizations

---

**Provider Tools**

- Order Entry
- CHCS
- Telcons
- Booking

---

**Lab Order**

- Requesting Location: Cardiology

**[Bacteriology Test Name]**

**Specimen Site/Sample**

- BACT/THROAT

**Schedule Type**
- Start Date: 19-Feb-2003
- Start Time: ...
- Frequency: Daily
- Duration (days): 1

**Collection Priority**
- Routine

**Collection Method**
- Send Patient To Lab

**Processing Priority**
- Routine

---

**Order Comment**

Note: Called lab once to follow-up.
Proposed Digital Imaging Concept
Medical Situational Awareness in the Theater (MSAT)

Provide commanders and their staffs actionable knowledge and enhanced medical situational awareness to enable critical decision making.

Medical Situational Awareness

Achieve Transformation by Leveraging existing success and emerging capabilities to Empower commanders with Actionable Knowledge.

- Joint Medical Information Systems
- Global Combat Support System
- Net-Centric Enterprise Services
- Net-Enabled Command and Control

- Services Oriented Architecture
- Mapping Tools
- Decision Support / Business Intelligence
Potential Civilian Uses

» Natural Disaster Support
» Humanitarian Assistance
» Pandemic Outbreaks
» Rural Health Care
» Visiting Nurse Services
» Public Schools
In Summary

» Provides single authoritative source for theater generated medical data
  ▫ The Medical component to GCSS and GCCS
» The theater input for the longitudinal electronic health record starting at the first responder
  ▫ Shares information with the CDR
» Leverages the MHS sustaining base systems
  ▫ Similar functionality between theater and sustaining base
» Provides solutions to support:
  ▫ Electronic healthcare documentation
  ▫ Patient movement and visibility
  ▫ MEDLOG and Blood management
  ▫ Medical situational awareness and surveillance
» Operates in austere communication environments
» Scalable, flexible and portable
Questions?

TMIP-J Office: 703-998-6900

TMIP-J Web site: http://www.ha.osd.mil/peo/tmip/