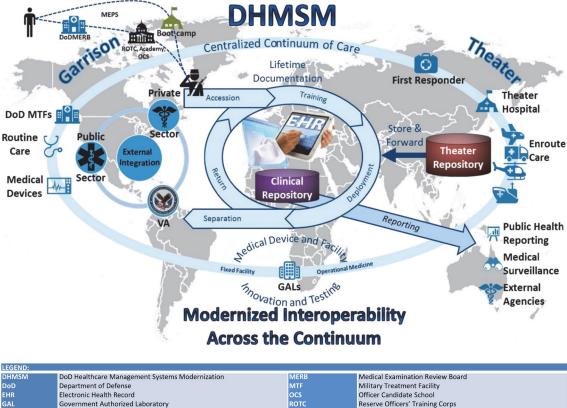# DOD Healthcare Management System Modernization (DHMSM)

Executive Summary

- The DOD Healthcare Management System Modernization (DHMSM) Program Office is fielding Military Health System (MHS) GENESIS to transform the way the DOD and the Department of Veterans Affairs provide military and veteran healthcare missions by creating a single health care record for each patient, used by both agencies. Currently, health care records reside in multiple legacy systems, making it difficult for health care providers to understand a patient's complete medical history. MHS GENESIS provides an integrated health record and delivers new capabilities to increase patient safety, such as barcode medication administration and decision support tools.

LEGEND:				
DHMSM	DoD Healthcare Management Systems Modernization		MERB	Medical Examination Review Board
DoD	Department of Defense		MTF	Military Treatment Facility
EHR	Electronic Health Record		OCS	Officer Candidate School
GAL	Government Authorized Laboratory		ROTC	Reserve Officers' Training Corps
MEPS	Military Entrance Processing Station		VA	Veterans Affairs

- MHS GENESIS will be deployed to DOD hospitals and clinics worldwide. MHS facilities encompass 54 hospitals, 377 medical clinics, and 270 dental clinics. Over 205,000 medical staff members will use the system to deliver and document healthcare for 9.4 million beneficiaries.

- In FY19, the Program Office developed and executed an MHS GENESIS corrective action plan to resolve the 388 incident reports identified during IOT&E. As of November 7, 2019, the Program Office had addressed 79 percent of these incident reports. The Joint Interoperability Test Command (JITC) will verify and validate Program Office fixes to IOT&E incident reports during an FOT&E planned for January and February 2020.

- The Program Office has improved MHS GENESIS training as compared to the Initial Operational Capability (IOC) site training. Trainers are now proficient at teaching operational scenarios and workflows, and users are fully engaged in the training. In preparation for FOT&E, MHS GENESIS deployed to four additional sites on September 7, 2019.

- In FY19, the Program Executive Officer (PEO) Defense Healthcare Management System (DHMS) and the Program Office expended substantial resources and effort to improve the cybersecurity posture of MHS GENESIS and to hold the Leidos Partnership for Defense Health (LPDH) and Cerner accountable for satisfying DOD cybersecurity requirements. PEO DHMS and the Program Office collaborated closely with the Defense Health Agency (DHA), DOD Chief Information Officer (CIO), DOT&E, and JITC. During a Cooperative Vulnerability and Penetration Assessment (CVPA), JITC discovered 7 new vulnerabilities, and validated 9 of 20 previously identified vulnerabilities were resolved and 11 were still present in the system. Patient records are at risk because of the vendor's lack of progress in meeting DOD cybersecurity requirements.

System

- The Program Office plans to field MHS GENESIS, a modernized Electronic Health Records system, to 205,000

MHS personnel providing care for 9.4 million DOD beneficiaries worldwide. MHS facilities encompass 54 hospitals, 377 medical clinics, and 270 dental clinics.
- MHS GENESIS comprises three major elements:
  - The Millennium suite of applications, developed by Cerner, which provides medical capabilities
  - Dentrix Enterprise, developed by Henry Schein, Inc., which provides dental capabilities
  - Orion Rhapsody Integration Engine, developed by Orion Health, which enables the majority of the external information exchanges
- MHS GENESIS will replace legacy healthcare systems including the Armed Forces Health Longitudinal Technology Application (AHLTA), Composite Health Care System (CHCS), and Essentris inpatient system. MHS GENESIS will replace legacy Operational Medicine components of the Theater Medical Information Program (TMIP) – Joint

software suite including AHLTA-Theater, TMIP CHCS Caché, and AHLTA-Mobile.

Mission
DOD medical staff will use MHS GENESIS to manage delivery of en route care, dentistry, emergency department, immunization, laboratory, radiology, operating room, pharmacy, vision, audiology, and inpatient/outpatient services. DOD medical staff will also use MHS GENESIS to perform administrative support, front desk operations, logistics, billing, and business intelligence.

Major Contractors
- Leidos – Reston, Virginia
- Cerner – Kansas City, Missouri
- Accenture Federal Services – Arlington, Virginia
- Henry Schein, Inc. – Melville, New York

Activity
- In FY19, the Program Office developed and executed an MHS GENESIS corrective action plan to resolve IOT&E incident reports from the four IOC sites. JITC conducted IOT&E at the first three IOC sites from September through December 2017 and at the fourth IOC site in July 2018.
- DHA conducted a DOD CIO-directed Independent Verification and Validation of MHS GENESIS from November 29, 2018, to March 6, 2019.
- The Program Office-led Cybersecurity Integrated Working Group (CIWG) developed and executed an MHS GENESIS cybersecurity get-well plan from December 2018 to May 2019.
- The Program Office installed Millennium Upgrade Version 2018.01.03 on April 26, 2019.
- JITC, with Service Operational Test Agency (OTA) assistance, observed and evaluated MHS GENESIS training provided at the next wave of MHS GENESIS sites from May 12 to July 27, 2019.
- The Program Office conducted a Cybersecurity Table Top (CTT) exercise to improve the MHS GENESIS cybersecurity posture on May 21 – 23, 2019.
- The Program Office installed Dentrix Enterprise Upgrade Version 8.0.95.325 on June 15, 2019.
- The Program Office implemented MHS GENESIS enhancements in August and September 2019, including an Oncology solution, Oral Maxillofacial Surgery solution, Defense Medical Logistics Enterprise System interface, Bi-Directional Pharmacy interface, and Cardiovascular picture archiving and communication system interface.
- The Program Office deployed MHS GENESIS at David Grant Medical Center, Travis AFB, California; Naval Health Clinic Lemoore, Naval Air Station Lemoore, California; Presidio of Monterey Army Health Clinic, Monterey, California; and Mountain Home Clinic, Mountain Home AFB, Idaho, on September 7, 2019. These sites were designated "Wave Travis" sites.

- DOT&E and JITC, with Service OTA assistance, observed the Wave Travis Go-Live on September 9 – 27, 2019.
- JITC and the Network Information Warfare Center (NIWC) Red Team conducted a CVPA at the Cerner Technology Center from July 29 to August 9, 2019, and at Travis AFB in FY20. The CVPAs were conducted in accordance with a DOT&E-approved test plan.

Assessment
- As of November 7, 2019, JITC closed 84 of 388 (22 percent) incident reports and identified an additional 223 of 388 (57 percent) as pending validation of closure. Of the 57 top priority incident reports, JITC closed 7 of 57 (12 percent) and identified 41 of 57 (72 percent) as pending validation of closure. JITC will validate Program Office fixes to IOT&E incident reports during an FOT&E in January and February 2020.
- The CIWG reported that out of 28 tasks, 6 were closed, 19 were closed pending validation, and 3 were being monitored.
- The CTT identified 12 potential cybersecurity threat vectors and associated risks to help inform MHS GENESIS cybersecurity hardening efforts.
- The Program Office improved Wave Travis MHS GENESIS training as compared to the IOC site training. Trainers were highly proficient at teaching the scenarios and workflows, and users were fully engaged in the training and understood the training material before accessing the MHS GENESIS system.
- The Cerner Data Center CVPA, conducted by JITC and NIWC Red Team, offered a first look at the success of the CIWG and CTT. During the CVPA, JITC confirmed that 9 of 20 cybersecurity vulnerabilities identified previously had been resolved. However, JITC discovered 7 new vulnerabilities and confirmed that 11 previously identified vulnerabilities were still present.

- The vendor's progress in implementing DOD cybersecurity requirements is not sufficient to protect DOD patient records.

Recommendations

The DHMSM Program Office, working with the military healthcare community, should continue their collaborative efforts to:

1. Resolve known cybersecurity deficiencies.
2. Conduct FOT&E at the Wave Travis sites to further evaluate corrective actions and revised training, and to inform further fielding decisions.