



HEALTH AFFAIRS

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, DC 20301-1200

JAN - 8 2010

The Honorable Joseph R. Biden, Jr.  
President of the Senate  
United States Senate  
Washington, DC 20510

Dear Mr. President:

I am pleased to forward the enclosed annual report as required by Section 723(d)(5) of the National Defense Authorization Act for Fiscal Year 2000, as amended by Section 753 of the NDAA for FY 2001.

The Department of Defense Military Health System (MHS) is committed to transforming health care through medical informatics, and applies informatics tools from the fields of information science, computer science, and health care to optimize means of acquiring, classifying, storing, retrieving, analyzing, and transmitting clinical knowledge and data. MHS knows the importance of achieving electronic health record interoperability for the provision of clinical care, improving the ability to share electronic health information, and eliminating redundant efforts to enhance the continuity and delivery of health care. MHS and other Federal leaders participate actively in strategic partnerships, public and private, to advance healthcare informatics and promote defined standards for electronic data sharing and systems interoperability.

Thank you for your continued support of the Military Health System.

Sincerely,

A handwritten signature in cursive script that reads "Ellen P. Embrey".

Ellen P. Embrey  
Deputy Assistant Secretary of Defense  
(Force Health Protection and Readiness)  
Performing the Duties of the  
Assistant Secretary of Defense  
(Health Affairs)

Enclosure:  
As stated



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JAN - 8 2010

The Honorable Daniel K. Inouye  
Chairman, Committee on Appropriations  
United States Senate  
Washington, DC 20510

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cc:  
The Honorable Thad Cochran  
Ranking Member



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WASHINGTON, DC 20301-1200

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WASHINGTON, DC 20301-1200

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HEALTH AFFAIRS

The Honorable Nancy Pelosi  
Speaker of the House of Representatives  
U.S. House of Representatives  
Washington, DC 20515

Dear Madam Speaker

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HEALTH AFFAIRS

The Honorable Carl Levin  
Chairman, Committee on Armed Services  
United States Senate  
Washington, DC 20510

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The Honorable John McCain  
Ranking Member



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WASHINGTON, DC 20301-1200

JAN - 8 2010

HEALTH AFFAIRS

The Honorable James H. Webb  
Chairman, Subcommittee on Personnel  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

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cc:  
The Honorable Lindsey O. Graham  
Ranking Member



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WASHINGTON, DC 20301-1200

JAN - 8 2010

HEALTH AFFAIRS

The Honorable Ike Skelton  
Chairman, Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

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The Honorable Howard P. "Buck" McKeon  
Ranking Member



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, DC 20301-1200

JAN - 8 2010

HEALTH AFFAIRS

The Honorable Susan A. Davis  
Chairwoman, Subcommittee on Military Personnel  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

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The Honorable Joe Wilson  
Ranking Member





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WASHINGTON, DC 20301-1200

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HEALTH AFFAIRS

The Honorable David Obey  
Chairman, Committee on Appropriations  
U.S. House of Representatives  
Washington, DC 20515

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The Honorable Jerry Lewis  
Ranking Member



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WASHINGTON, DC 20301-1200

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HEALTH AFFAIRS

The Honorable John P. Murtha  
Chairman, Subcommittee on Defense  
Committee on Appropriations  
U.S. House of Representatives  
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As stated

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The Honorable C. W. Bill Young  
Ranking Member

**Report to Congress**



**Fiscal Year 2009  
October 1, 2008 – September 30, 2009**

**Report on Medical Informatics**

**Required by**

**Section 723 of the National Defense Authorization Act for FY 2000  
as amended by  
Section 753 of the National Defense Authorization Act for FY 2001**

# REPORT TO CONGRESS ON MEDICAL INFORMATICS

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## **REPORT TO CONGRESS ON MEDICAL INFORMATICS**

This Annual Report to Congress on Medical Informatics is required by Section 723(d)(5) of the National Defense Authorization Act for Fiscal Year (FY) 2000 (Public Law 106-65; 113 Stat. 697; 10 U.S.C. 1071 note) (NDAA FY 2000), as amended by Section 753 of the National Defense Authorization Act for FY 2001 (Public Law 106-398; 114 Stat. 1654A-196) (NDAA FY 2001).

NDAA FY 2001 requires that the Secretary of Defense submit to Congress an annual report on medical informatics discussing the coordination of the development, deployment and maintenance of healthcare informatics systems within the federal government, and between the federal government and the private sector; the progress or growth occurring in medical informatics; and how the Department of Defense (DoD) Military Health System (MHS) and the Department of Veterans Affairs (VA) healthcare system can use the advancement of knowledge in medical informatics to raise the standards of healthcare and treatment and the expectations for improving healthcare and treatment. (In this Report, Departments means DoD and VA, unless context clearly indicates otherwise.)

### **EXECUTIVE SUMMARY**

MHS is committed to transforming healthcare through medical informatics. The field of medical informatics melds elements of information science, computer science, and healthcare, utilizing resources, devices and methods from each discipline. MHS applies informatics tools to optimize means of acquiring, classifying, storing, retrieving, analyzing and transmitting clinical knowledge and data. These means support the primary healthcare mission of MHS: delivering uniform, high-quality healthcare to active duty and retired Service members and their families, collectively more than 9.5 million MHS beneficiaries.

MHS is a major healthcare delivery system, purchaser of healthcare services, and investor in health information technology (HIT). MHS knows the importance of achieving electronic health record (EHR) interoperability for the provision of clinical care; improving the ability to share electronic health information; and eliminating redundant efforts to enhance the continuity and delivery of healthcare. MHS also knows the importance of utilizing medical informatics tools to achieve these ends. MHS and other federal leaders participate actively in strategic partnerships, public and private, to advance healthcare informatics and promote defined standards for electronic data sharing and systems interoperability.



## **REPORT TO CONGRESS ON MEDICAL INFORMATICS**

### ***Section I: DoD's Electronic Health Record (EHR) System (page 7)***

The military's worldwide EHR system supports MHS professionals enterprise wide in the delivery of uniform, quality health promotion and healthcare; clinical analysis; medical surveillance; development of evidence-based clinical practice guidelines; and outcomes research. This medical and dental EHR system is a key enabler of military medical readiness. It captures and stores structured data in a Clinical Data Repository (CDR), and gives healthcare providers secure 24x7 access to health records of highly mobile MHS beneficiaries.

### ***Section II: DoD/VA Interagency Oversight (page 9)***

DoD/VA interagency initiatives are governed jointly by the Departments' senior leaders. The mission of the VA/DoD Joint Executive Council (JEC) is to enhance DoD/VA information sharing and collaboration; ensure the efficient use of federal services and resources; and identify opportunities such as policy, operations and capital planning to advance seamless transition initiatives. JEC coordinates the development of the VA/DoD JEC Joint Strategic Plan (JSP), and works through its subcouncils—the VA/DoD Health Executive Council (HEC), the DoD/VA Benefits Executive Council (BEC) and the DoD/VA Interagency Program Office (IPO)—to implement goals and objectives related to sharing health data, improving continuity of care, and facilitating benefits delivery. Day-to-day responsibility for oversight of HIT initiatives resides with the HEC Information Management/Information Technology (IM/IT) Work Group.

Another level of interagency coordination ensures that Wounded Warrior issues, including medical informatics issues, receive due attention. The Wounded, Ill and Injured (WII) Senior Oversight Committee (SOC), co-chaired by the Deputy Secretaries of DoD and VA, engages senior leaders of the Departments to address WII issues. The Overarching Integrated Product Team (OIPT) coordinates, integrates and synchronizes work, and makes recommendations to WII SOC regarding policy, resource and implementation decisions.

IPO provides management and oversight of DoD/VA EHR interoperability initiatives. IPO receives guidance from the Secretaries of DoD and VA, and from the JEC, and serves as the single point of accountability for the Departments in the rapid development and implementation of EHR systems and capabilities to provide full interoperability of healthcare information.

## **REPORT TO CONGRESS ON MEDICAL INFORMATICS**

Through the DoD/VA Interagency Clinical Informatics Board (ICIB), DoD and VA clinicians play a vital advisory role in the development of interoperable informatics systems. ICIB affords clinicians an opportunity to apply functional experience by identifying and prioritizing informatics initiatives or capabilities for consideration by the Departments.

### ***Section III: DoD/VA Interagency Health Informatics Initiatives and Cooperative Efforts (page 13)***

DoD and VA continue to collaborate on interagency informatics activities and deliver HIT solutions that significantly improve the secure sharing of electronic health information. Current initiatives include:

- Federal Health Information Exchange (FHIE)
- Bidirectional Health Information Exchange (BHIE)
- DoD/VA Clinical Data Repository/Health Data Repository (CHDR)
- Medical Image Sharing
- Laboratory Data Sharing Initiative (LDSI)
- DoD/VA Network Gateways

These initiatives promote health data sharing and interoperability between the Departments, enhance healthcare delivery, and improve the continuity of care for beneficiaries.

### ***Section IV: Multi-Agency Health Informatics Initiatives (page 21)***

DoD continues efforts to advance healthcare and IT standards, eliminate barriers to interoperability, and facilitate the secure, seamless exchange of health information across the healthcare continuum. DoD collaborates with the Department of Health and Human Services (HHS) through the Office of the National Coordinator for Health Information Technology (ONC) on the development, adoption and implementation of HIT standards. DoD remains actively engaged in ONC's strategic initiatives to accelerate the development and adoption of interoperable health records.

## REPORT TO CONGRESS ON MEDICAL INFORMATICS

DoD maintains an active leadership role in the Federal Healthcare Architecture (FHA) Nationwide Health Information Network (NHIN) CONNECT initiative (formerly the Nationwide Health Information Network Consortium (NHIN-C)) and continues as a key partner in the American National Standards Institute Healthcare Information Technology Standards Panel (HITSP). DoD maintains seats on the ONC HIT Policy Committee and ONC HIT Standards Committee, each formed under the Federal Advisory Committee Act (FACA) pursuant to requirements of the American Recovery and Reinvestment Act of 2009 (ARRA).

President Barack Obama and the Secretaries of Defense and Veterans Affairs announced in Spring 2009 that DoD and VA will work together on the Virtual Lifetime Electronic Record (VLER) project. The objectives of VLER are to further the development and adoption of national standards; use a non-proprietary, standards based, service oriented architecture (SOA); and access data through the NHIN gateway. DoD recognizes a compelling need to promote information sharing, not just with other federal agencies, but also with private sector healthcare providers that are part of the managed care support contractor network of providers. As systems and data repositories mature and as standards and processes are refined and implemented, DoD continues its commitment to collaboration and appropriate sharing of health information. Sharing health information with private sector partners will strengthen the continuity and quality of care for MHS beneficiaries. Together, DoD and VA champion the development and adoption of new standards within Standards Development Organizations (SDOs).

### *Section V: MHS Medical Informatics Decision Making Tools (page 29)*

Advances in medical informatics enhance the usability of collected data, as data becomes easier to retrieve and analyze. New tools increase access to information; facilitate data analysis to support surveillance of potential disease outbreaks; identify opportunities for improving population health; and highlight examples of clinical and business best practices. MHS uses a host of informatics support tools for clinical support, medical logistics and business resources, including:

#### *Clinical Support*

- Centralized Credentials Quality Assurance System (CCQAS)
- Clinical Data Mart (CDM)
- Enterprise Wide Scheduling and Registration (EWS-R)
- Nutrition Management Information System (NMIS)
- Patient Safety Reporting (PSR)
- Special Needs Program Management Information System (SNPMIS)

## REPORT TO CONGRESS ON MEDICAL INFORMATICS

### *Medical Logistics*

- Common User Database (CUD)
- Defense Blood Standard System (DBSS)
- Defense Medical Logistics Standard Support (DMLSS)
- Defense Occupational and Environmental Health Readiness System—Hearing Conservation (DOEHRS-HC)
- Defense Occupational and Environmental Health Readiness System—Industrial Hygiene (DOEHRS-IH)
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- Patient Movement Items Tracking System (PMITS)
- Radio Frequency Identification (RFID) Pilot Program
- TRICARE Online (TOL)

### *Business Resources*

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- Defense Medical Human Resources System-Internet (DMHRSi)
- Duplicate Claims System (DCS)
- Enterprise Wide Provider Database (EWPD)
- Expense Assignment System (EAS)
- Managed Care Forecasting & Analysis System (MCFAS)
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- Purchased Care Data Warehouse (PCDW) and Purchased Care Detailed Information System (PCDIS )

## REPORT TO CONGRESS ON MEDICAL INFORMATICS

- Third Party Outpatient Collection System (TPOCS)
- TRICARE Encounter Data (TED) System

### *Section VI: MHS Medical Informatics Partnerships and Outreach Activities (page 45)*

In FY 2009, MHS continued to sponsor and participate in outreach activities with MHS personnel, other federal agencies, professional organizations and industry partners, promoting the use and advancement of medical informatics and HIT to enhance the quality and continuity of healthcare delivery. MHS reaches out through conferences, product demonstrations, and traditional and emerging media, both print and electronic.

# REPORT TO CONGRESS ON MEDICAL INFORMATICS

## I. DOD'S ELECTRONIC HEALTH RECORD (EHR) SYSTEM

DoD continues to expand and improve its medical and dental EHR system, including AHLTA. AHLTA supports MHS professionals in the delivery of uniform, high-quality health promotion and healthcare; clinical analysis; medical surveillance; development of evidence-based clinical practice guidelines; and outcomes research. A key enabler of military medical readiness, AHLTA captures and stores structured data in its CDR, and gives healthcare providers secure 24x7 access to health records of highly mobile MHS beneficiaries.

AHLTA has been fully deployed in military medical fixed and deployed facilities since December 2006 and currently has 77,000 active users. Records in AHLTA's CDR are retrievable worldwide at points of care, including 889 fixed military medical and dental treatment facilities, onboard ships, and in deployed medical facilities. AHLTA's reach extends to deployed treatment settings in Iraq, Kuwait and Afghanistan, where AHLTA Theater (AHLTA-T) captures outpatient encounter records and transfers them to the AHLTA CDR.

AHLTA use continues to grow at a significant pace. As of September 30, 2009, AHLTA has processed and stored records of more than 122 million outpatient encounters. On average, AHLTA processes more than 152,000 encounters each workday. As of September 30, 2009, more than 2.5 million outpatient clinical encounters have been documented in AHLTA-T and transferred to AHLTA CDR. Outpatient and inpatient Theater data is available to DoD clinicians through AHLTA and to VA clinicians through the Veterans Information Systems and Technology Architecture (VistA), VA's EHR.

MHS is upgrading AHLTA to improve the clinical encounter documentation process and provide user requested functional capabilities based on lessons learned from AHLTA's Block 1 deployment. Several enhancements are intended to improve health care provider workflow processes and minimize the time required to document clinical encounters. New software capabilities include support for automated clinical practice guidelines, electronic patient signatures, and health history modules that allow patients to self-report information. Deployment is scheduled to be completed during the first quarter of FY 2010.

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Essentris™, a commercial off-the-shelf (COTS) product, is the interim inpatient documentation system for MHS. Clinicians use Essentris to document critical care, acute care, labor and maternal childcare, psychiatric care, pediatrics, and operative care. As of September 30, 2009, Essentris is operational at 27 of 60 DoD Essentris inpatient sites, covering 61 percent of DoD's total inpatient beds. Additionally, DoD has implemented the BHIE inpatient documentation sharing capability at 24 of those 27 sites, covering 59 percent of DoD's total inpatient beds. (Further discussion of BHIE and Essentris follows on page 14.) MHS plans additional deployments, to increase coverage to more than 90 percent of DoD's total inpatient beds by January 2011. Use of the inpatient documentation capability at Landstuhl Regional Medical Center plays a critical role in ensuring continuity of care, supporting the capture and transfer of inpatient records of care for Wounded Warriors. These records are now accessible stateside to DoD and VA providers caring for injured Service members or Veterans.

On November 5, 2008, AHLTA received full certification from the Certification Commission for Healthcare Information Technology (CCHIT), an independent non-profit organization that sets benchmarks for EHR systems. By leveraging AHLTA, DoD has substantially increased the secure sharing of appropriate electronic health information with VA. Data sharing initiatives enhance healthcare delivery and improve the continuity of care for persons who have served our country.

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## **II. DOD/VA INTERAGENCY OVERSIGHT**

### **A. VA/DoD Joint Executive Council (JEC)**

DoD and VA medical informatics initiatives are jointly governed at the highest levels of the Departments. Chartered in 2002, the VA/DoD JEC is comprised of senior leaders from the Departments and co-chaired by DoD's Under Secretary for Personnel and Readiness and VA's Deputy Secretary. JEC's purpose is to enhance DoD/VA information sharing and collaboration activities; ensure the efficient use of federal services and resources; and identify opportunities such as policy, operations and capital planning to advance seamless transition initiatives. JEC oversees HEC, BEC, IPO and additional councils and work groups designated by the co-chairs. Through a joint strategic planning process, JEC makes recommendations regarding the strategic direction of joint coordination and sharing efforts between the Departments. JEC then oversees progress and implementation through the JSP.

### **B. VA/DoD Health Executive Council (HEC)**

HEC, co-chaired by DoD's Assistant Secretary for Health Affairs and VA's Under Secretary for Health, provides high-level interagency cooperation and coordination in a joint effort to improve healthcare services and reduce healthcare costs for DoD and VA beneficiaries. HEC is responsible for identifying changes in healthcare related policies, procedures and practices, and for assessing additional opportunities to coordinate and share health-related services and resources. HEC provides quarterly updates to JEC on the status of joint healthcare initiatives identified in the JSP.

### **C. DoD/VA Benefits Executive Council (BEC)**

BEC is co-chaired by DoD's Principal Deputy Under Secretary for Personnel and Readiness and VA's Under Secretary for Benefits. BEC collaborates on initiatives to expand and improve information sharing, refine records retrieval processes, and identify ways to improve the benefits claims process.

### **D. VA/DoD JEC Joint Strategic Plan (JSP)**

Since 2003, the JSP has been a roadmap for JEC and its subcouncils, guiding the implementation of goals and objectives related to sharing data and improving care and benefits administration for beneficiaries.



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The JSP seeks to promote:

- Collaboration** Achieving shared goals through mutual support of both common and unique mission requirements
- Stewardship** Providing the best value for beneficiaries and taxpayers
- Leadership** Establishing clear policies and guidelines for VA/DoD partnership, promoting active decision making and ensuring accountability for results

The JSP articulates a vision for collaboration; establishes priorities for collaborating; launches processes to implement interagency policy decisions; develops joint operation guidelines; and institutes performance monitoring to track the Departments' progress toward achieving defined goals and objectives.

Each year JEC reviews, updates and improves the JSP. In FY 2009, JEC reviewed and updated the JSP and reaffirmed strategic goals for FY 2009-2011. With JEC's leadership and the JSP's clear goals, DoD and VA have succeeded in meeting the majority of JSP health data sharing milestones established for FY 2009. Goals, strategies, key milestones, and performance measures in the FY 2009-2011 JSP have served as a template for development of the FY 2010-2012 JSP. JEC is currently finalizing the review and update for JSP FY 2010-2012.

### **E. HEC Information Management/Information Technology (IM/IT) Work Group**

The HEC IM/IT Work Group, co-chaired by the MHS Chief Information Officer (CIO) and the CIO of the Veterans Health Administration (VHA), maintains day-to-day responsibility for health data sharing and EHR interoperability initiatives. The purpose of the HEC IM/IT Work Group is to ensure that appropriate beneficiary medical data is visible, accessible and understandable through secure and interoperable information management systems.

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### **F. Wounded, Ill and Injured (WII) Senior Oversight Committee (SOC)**

WII SOC is co-chaired by Deputy Secretaries of DoD and VA, and includes the Departments' most senior staff. Chartered in May 2007, WII SOC ensures senior-level military and civilian oversight, and interagency coordination of responses and plans, to meet the recommendations of various commissions and review groups looking at Wounded Warrior issues. WII SOC focuses on issues surrounding wounded, ill and injured Service members returning from Operation Enduring Freedom or Operation Iraqi Freedom; JEC focuses on broader DoD/VA considerations.

### **G. Overarching Integrated Product Team (OIPT)**

Supporting the WII SOC decision making process is OIPT, co-chaired by DoD's Principal Deputy Under Secretary for Personnel and Readiness and VA's Under Secretary for Benefits, and composed of senior officials from the Departments. OIPT reports to WII SOC; coordinates, integrates and synchronizes work; and makes recommendations to WII SOC regarding policy, resource and implementation decisions. Through WII SOC and OIPT, the Departments address and implement recommendations proposed by various commissions and review groups, and implement the Wounded Warrior and Veterans requirements of Section 1635 of the National Defense Authorization Act of FY 2008 (NDAA FY 2008), as amended by Section 252 of the National Defense Authorization Act of FY 2009 (NDAA FY 2009). Through WII SOC, the Departments support several Lines of Actions (LOAs), with one LOA specifically focused on DoD/VA data sharing initiatives.

### **H. DoD/VA Interagency Program Office (IPO)**

Section 1635 of NDAA FY 2008 mandated the establishment of a DoD/VA IPO to act as a single point of accountability in the Departments' rapid development and implementation of EHR systems and capabilities. The Departments established IPO with the appointment of the Acting Director and Acting Deputy Director on April 17, 2008. WII SOC expanded IPO's scope to include the Departments' electronic sharing of personnel and benefits data. IPO receives guidance from the Secretaries of DoD and VA, and from JEC. In consultation with HEC, IPO collaborates on health related data sharing; in consultation with BEC, IPO collaborates on personnel and benefits data sharing.

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DoD and VA met the NDAA FY 2008 goal for implementing DoD/VA EHR systems and capabilities to allow full interoperability of healthcare information between the Departments by September 30, 2009 to support the provision of clinical care, and to accelerate the exchange of healthcare information between the Departments. The Departments will continue to enhance interoperability to meet the future needs of clinicians, claims administrators and others.

### **I. DoD/VA Interagency Clinical Informatics Board (ICIB)**

ICIB is a work group reporting to HEC. The mission of ICIB is to give clinicians a direct voice in the prioritization of DoD/VA interoperability capabilities. ICIB is a DoD/VA clinician led group, with DoD's Deputy Assistant Secretary for Clinical and Program Policy and VHA's Chief Patient Care Services Officer as lead functional proponents. ICIB establishes clinical priorities for the Departments' sharing of electronic healthcare information, and reviews planned clinical information system solutions for DoD/VA sharing to ensure alignment to ICIB's clinical sharing priorities.

In support of Section 1635 of NDAA FY 2008 and the FY 2009-2011 JSP milestone requirement for the Departments to achieve EHR interoperability for the provision of clinical care by September 30, 2009, ICIB submitted and briefed final recommendations to IPO and the HEC IM/IT Work Group. HEC approved the recommendations in August 2008. In June 2009, ICIB submitted additional EHR interoperability objectives to the HEC IM/IT Work Group for FY 2010 and beyond. This will be briefed to HEC in early FY 2010. ICIB is now participating in JSP FY 2010-2012 review efforts. For future years, ICIB will prioritize additional health related sharing capabilities to continue the advancement of DoD/VA interoperability in a manner that supports clinicians in healthcare delivery.

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### **III. DOD/VA INTERAGENCY HEALTH INFORMATICS INITIATIVES AND COOPERATIVE EFFORTS**

DoD and VA continue their strong partnership in interagency medical informatics activities, delivering HIT solutions that significantly improve the secure sharing of appropriate electronic health information. In the last decade, health data sharing and interoperability activities between the Departments have increased substantially, with the primary benefit being that providers have access to more complete and accurate health records for Service members and Veterans. These initiatives enhance healthcare delivery to beneficiaries receiving care from both Departments and improve the continuity of care for patients transitioning from DoD to VA. These initiatives also support WII SOC objectives to improve the care and transition of Wounded Warriors. Examples of joint efforts follow:

#### **A. Federal Health Information Exchange (FHIE)**

Since 2001, for separated Service members, DoD has supported the monthly transfer of electronic health information from DoD to VA via FHIE, a jointly developed data repository. VA providers and benefits specialists access FHIE data daily for use in delivering healthcare and making claims determinations. VA clinicians access data using VA's EHR Remote Data Views function in VistA. Specialists in VA benefits access data through the Compensation and Pension Record Interchange (CAPRI) system, which supports the adjudication of compensation and pension benefit claims. CAPRI also facilitates determinations of entitlement to vocational counseling, planning and training, as well as insurance and waiver of premiums for Veterans with a service-connected disability rating of 100 percent. Transferred data includes:

- inpatient and outpatient laboratory results and radiology reports
- outpatient pharmacy data from military treatment facilities (MTFs), and DoD retail network and mail-order pharmacies
- allergy information
- inpatient discharge summaries
- admission, disposition and transfer information
- consultation reports
- standard ambulatory data record information such as diagnostic codes, primary care physician and treating physician
- patient demographic information
- Pre- and Post-Deployment Health Assessment (PPDHA) and Post-Deployment Health Reassessment (PDHRA) forms

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As of August 2009, DoD had transferred health information for over 4.9 million patients to VA. Of these patients, approximately 1.7 million presented to VA for care, treatment or claim determination. The number of electronic messages transferred exceeds 266 million.

DoD also transfers data for VA patients undergoing treatment in DoD facilities under local sharing agreements. As of August 2009, more than 4.2 million messages concerning laboratory, radiology, pharmacy and consultations had been transmitted on VA patients treated in DoD facilities. The amount of data available to VA continues to grow as DoD extracts health information on recently separated Service members and transfers it to VA. These DoD/VA data transfers comply with Health Insurance Portability and Accountability Act of 1996 (HIPAA) privacy regulations.

Since 2005, deployment health assessments completed by Service members and demobilized Reserve and National Guard members as they leave for and return from duty outside the United States have been available to VA providers. Aggregated assessments allow the Departments to monitor the overall health condition of deployed troops, inform them of potential health risks, and maintain and improve the health of Service members and Veterans. Monthly transmissions include health assessments by deployed and demobilized Reserve and National Guard members. Weekly transmissions include deployment health assessments for individuals referred to VA for care or evaluation. As of August 2009, DoD transmissions to VA covered more than 2.5 million PPDHA and PDHRA forms on more than 1.0 million individuals.

### **B. Bidirectional Health Information Exchange (BHIE)**

Since 2004, the Departments have maintained BHIE for patients undergoing treatment by both DoD and VA. BHIE enables real-time bidirectional sharing of:

- allergy information
- outpatient pharmacy data
- demographic data
- inpatient and outpatient laboratory results and radiology reports
- ambulatory encounters
- procedures
- vital sign data (blood pressure, heart rate, respiratory rate, temperature, height, weight, oxygen saturation, pain severity and head circumference)
- family history, social history, other history
- questionnaires

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- Theater clinical data (inpatient notes, outpatient encounters, and ancillary clinical data such as pharmacy data, allergies, laboratory results and radiology reports)

For patients undergoing treatment by both Departments, BHIE data is available through both AHLTA and VistA. As of August 2009, more than 3.4 million shared patients, including more than 1.6 million not in the FHIE repository and more than 150,800 Theater patients, were available through BHIE.

To increase the availability of clinical information on shared patients, VA and DoD collaborated to extend BHIE functionality to allow bidirectional access to inpatient documentation from DoD's Essentris inpatient documentation system. As of September 30, 2009, this capability was operational at 24 of 27 MTFs with Essentris. These facilities are some of DoD's largest inpatient facilities, representing more than 59 percent of DoD's total inpatient beds. Additional DoD Essentris site deployments are planned in FY 2010, to increase coverage to more than 90 percent of DoD total inpatient beds by January 2011. In 2008, additional DoD inpatient note types became available to DoD providers and VA providers in the Puget Sound area, including operative notes; consultation, history and physical reports; transfer summary notes; initial evaluation notes; procedure notes; evaluation and management notes; pre-operative evaluation notes; and post-operative evaluation and management notes. It is anticipated that VA will expand access to these DoD inpatient note types to additional VA sites in the future.

### **C. DoD/VA Clinical Data Repository/Health Data Repository (CHDR)**

In September 2006, the Departments established interoperability between AHLTA's CDR and VA's Health Data Repository (HDR). The DoD/VA CDR/HDR (CHDR) interface permits the exchange of interoperable and computable outpatient pharmacy and medication allergy data between the Departments for patients who receive care from both healthcare systems. The exchange of computable outpatient pharmacy and medication allergy data enables drug-drug interaction checking and drug allergy checking using data from both Departments. This data exchange enhances patient safety and quality of care. It includes information from MTF pharmacies, DoD retail network and mail-order pharmacies, and VA facility pharmacies. In December 2007, all DoD facilities received the capability manually to initiate the exchange of this data on shared patients. In September 2008, DoD automated a process to identify patients being treated in both Departments and began setting an active dual consumer (ADC) "flag" on approximately 50 patients each day. In July 2009, DoD increased the automated ADC activation to approximately 100 patients each day. For DoD providers, VA pharmacy data is presented in the same place as DoD pharmacy data. No additional steps are necessary for them to have this integrated view of pharmacy data.

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### D. NDAAs Interoperability Milestones

In support of Section 1635 of NDAAs FY 2008 and the JSP FY 2009-2011 milestone requirement that the Departments implement systems or capabilities allowing for full EHR interoperability by September 30, 2009, ICIB defined “full interoperability” as the ability to share information necessary to support the continuum of care between DoD and VA. ICIB set forth six high-level capabilities which, when implemented and added to data already shared between the Departments, would constitute full interoperability. ICIB submitted and briefed final recommendations to IPO and the HEC IM/IT Work Group in June 2008, and HEC approved them in August 2008. By September 30, 2009, VA and DoD had achieved ICIB’s six interoperability capabilities, as described below:

<b>Capability</b>	<b>Description</b>
DoD expansion of Essentris to at least one additional site in each military medical department	<p>CliniComp’s Essentris™ product suite is the current Inpatient Documentation System solution for DoD. DoD coordinated with the Services to deploy Essentris to one additional site per Service by September 2009. Four Army sites were added: Reynolds ACH, Moncrief ACH, US Army Hospital, Seoul, Korea and Fort Leonard Wood ACH. Navy and Air Force sites included Naval Hospital Bremerton and David Grant Medical Center, Travis Air Force Base.</p> <p>As of September 30, 2009, Essentris was operational at 27 DoD sites, and inpatient discharge summaries were available to DoD and VA providers from 24 of the 27 DoD Essentris sites through BHIE, accounting for 59 percent of total DoD inpatient beds.</p>
Demonstrate the operation of Partnership Gateways in support of joint DoD-VA health information sharing	Four new DoD/VA gateways to support expanded bandwidth requirements are operational in Dallas, Texas; Kansas City, Missouri; Santa Clara, California; and Reston, Virginia. Efforts are underway to migrate data traffic to the new gateways, with 30 percent complete as of September 2009.

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<b>Capability</b>	<b>Description</b>
<p>Enhance sharing with VA of social history data currently captured in DoD EHR</p>	<p>Baseline functionality was completed in November 2008, for one way sharing of social history data (DoD to VA). The Departments will address improved usability for enhancements beyond September 2009.</p>
<p>Demonstrate initial capability for scanning medical documents of Service members into DoD EHR and forwarding those documents electronically to VA</p>	<p>The Departments met the objective to demonstrate an initial capability for scanning medical documents and sharing these documents electronically with the VA utilizing a test environment. When fully implemented this capability will enable DoD users to scan and import documents and artifacts; associate them with a patient's record; and make them globally accessible to authorized DoD and VA users. DoD will begin deployment to Limited User Test sites in the first quarter of FY 2010.</p>
<p>Provide all Periodic Health Assessment data stored in DoD EHR to VA in such a fashion that questions are associated with responses</p>	<p>In November 2008, the Departments met the initial capability, enabling the display of health assessment information using BHIE, and establishing the capability for VA to view questions and answers from questionnaires collected at DoD MTFs and stored in DoD's EHR. The Departments successfully completed the ability for VA to view information from DoD's health assessment reporting tool in September 2009.</p>
<p>Provide initial capability to share electronic access to separation physical exam information captured in DoD EHR with VA</p>	<p>The initial capability, which supports the separation physical exam processes, was met in May 2008. Healthcare information currently shared includes Outpatient Treatment Record; Inpatient Discharge Summaries; Ancillary Data (laboratory, radiology and pharmacy); and Deployment Health Assessments.</p>



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### E. Medical Image Sharing

Timely access to healthcare information is critical for providers supporting the healthcare missions of DoD and VA. Digital images, a significant source of information, must be protected, preserved and readily available throughout the continuum of care, from Theater to sustaining base to VA medical facilities. Exchange of electronic medical images enhances patient care and reduces the likelihood of unnecessary duplication of radiology studies. Ideally, an EHR should give clinicians access to multimedia healthcare information, including:

- Radiographic images, including computed radiology (CR), digital radiography (DX), computerized tomography (CT), magnetic resonance (MR), and ultra sound (US) images
- Clinical photographs, including endoscopy, laparoscopy, retinal scans and anatomic pathology
- Electrocardiograms and echocardiographs
- Digital photographs; for example, digital photographs of dermatology lesions and rashes
- Scanned documents

Some of our most seriously wounded, ill and injured Service members transfer directly from inpatient status at a DoD MTF to inpatient status at a VA Polytrauma Rehabilitation Center (PRC). Most transfers are from Walter Reed Army Medical Center (WRAMC), National Naval Medical Center (NNMC) Bethesda, or Brooke Army Medical Center (BAMC), to a VA PRC in Minneapolis, Minnesota; Palo Alto, California; Tampa, Florida; or Richmond, Virginia. For these patients, it is critically important to transmit as much information as possible to the receiving facility with or prior to the patient's transfer.

An initiative has been underway since March 2007 to facilitate transmission of digital images and scanned health records from DoD to VA when a patient transfers directly from one of the three listed medical centers to one of the four listed PRCs. It is not uncommon for DoD to transfer hundreds of images, including CR, DX, CT, MR and US images, for a single patient. In these cases, DoD transmits images from the Picture Archive Communication System (PACS) at WRAMC, NNMC or BAMC to VA in a format consistent with VA's EHR, VistA Imaging. VA stores the images on VA PACS, where they are viewable by the patient's VA clinicians and radiologists. A VA PRC may request electronic transmission of radiology images for patients transferred in the past and continuing in VA care. As of August 31, 2009, DoD MTFs had transferred digital images for more than 196 patients to VA PRCs. This is a manual and time intensive process, not scalable to broader implementation.

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In addition to transferring medical images for these patients, DoD scans, indexes and converts health record information from electronic systems and paper documents at WRAMC, NNMC and BAMC, creating a single portable document format (PDF) file for electronic transmission to a VA PRC. The PDF file contains health records from the entire inpatient stay as well as available records of treatment provided in Theater medical facilities, care rendered during transport, and care rendered at Landstuhl Regional Medical Center. VA clinicians who are involved in a patient's treatment may view scanned documents from clinic workstations. Electronic bookmarks enable clinicians to locate and view specific types of records quickly. As of August 31, 2009, DoD MTFs had scanned and transmitted health records for more than 260 patients to VA PRCs.

In 2004, as part of a medical image sharing demonstration project, William Beaumont Army Medical Center and El Paso VA Healthcare System implemented a solution leveraging BHIE infrastructure to exchange digital radiology messages. The Departments have expanded the demonstration project to support clinicians' bidirectional exchange of digital images at key locations. They continue to monitor and evaluate current capability as a transitional step toward broader image sharing capability.

The interim health records scanning capability is a labor intensive, manual process that is not scalable to support data transfers from all DoD to all VA facilities. Going forward, DoD envisions a scanning and image sharing capability accessible through the Healthcare Artifact and Image Management Solution (HAIMS) project, now in development. HAIMS will give DoD and VA clinicians patient-centric global awareness of available images and efficient global interagency access to view them. Global awareness means that clinicians will know that clinically relevant patient images exist, wherever they may be within the continuum of care. Global interagency access means that clinicians and specialists from either Department may view relevant images, regardless of their originating location.

A phased development will be used for HAIMS. Phase 1 involves development of a software solution and hardware requirements to implement a globally distributed enterprise content management system; it will conclude with limited testing at designated sites, allowing clinicians to search, view, register, edit, save, scan and import multiple file types, and making DoD artifacts and referential images available to VA providers through BHIE. HAIMS Phase 2 will focus on development activities to integrate HAIMS fully into the clinical workflow in DoD's EHR. Going forward, ICIB will prioritize image-sharing capabilities. DoD will begin deployment of HAIMS to DoD Limited User Test sites in the first quarter of FY 2010.

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### **F. Laboratory Data Sharing Initiative (LDSI)**

LDSI facilitates the electronic sharing of laboratory orders and results between and among DoD, VA and commercial reference laboratories. LDSI also provides laboratory order portability between DoD/VA sites that have local sharing agreements for laboratory services. The ability to enter and transmit orders electronically to a reference laboratory, coupled with the ability to enter and transmit results electronically to the submitting facility, reduces burdens on administrative personnel and improves security of patient information. Additionally, LDSI enhances patient safety by eliminating potential clerical errors resulting from manual transcription of results from paper reports into the computer system. The decision to offer referral testing and to use LDSI to allow electronic orders and results retrieval is based on local business case analysis.

LDSI is used daily for laboratory chemistry tests including clinical chemistry, hematology, toxicology and serology between DoD and VA at sites where one Department uses the other as a reference laboratory. DoD and VA also have the capability for anatomic pathology (AP) and microbiology order entry and results retrieval utilizing Logical Observation Identifiers Names and Codes (LOINC) and Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) data standards. The Departments will continue to coordinate requests for activation of the LDSI interface at sites where a business case exists.

### **G. DoD/VA Network Gateways**

In 2008, a DoD/VA team defined functional, infrastructure, and policy interoperability requirements that resulted in a DoD/VA Multiple Gateway concept of operations. The Departments have achieved the development and implementation of an enterprise architecture infrastructure solution and the establishment of a series of strategically planned network gateways between the Departments. The DoD/VA gateways provide secure, redundant connectivity between DoD and VA facilities, and facilitate the seamless transfer of health data. In 2008 and 2009, the Departments established four enterprise gateways, which are now receiving migrated network traffic for data exchange. As of September 2009, 30 percent of network traffic has migrated to new enterprise gateways. The Departments target FY 2010 for completing the migration of data traffic shared from DoD/VA enterprise systems (existing as of June 2009); this migration will be off of the VA Austin Automation Center to new multipurpose gateways. Additional gateways may be required to support DoD/VA data sharing efforts in the future.

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### IV. MULTI-AGENCY HEALTH INFORMATICS INITIATIVES

A cornerstone of DoD's medical informatics transition strategy is the elimination of barriers to interoperability and the facilitation of the secure, seamless exchange of appropriate health information across the healthcare continuum. In working toward this strategic objective, DoD engages in interagency efforts with HHS and VA to increase cross-agency health information sharing; ensure continuity of care; improve health surveillance among federal agencies; and foster health information sharing with the private sector. DoD also participates in national efforts to advance healthcare and HIT standards; to define and lead the approach toward coordinated multi-entity healthcare delivery; and to enable DoD to enhance its integration and management of the complex defense healthcare system.

#### A. Office of the National Coordinator (ONC)

DoD is committed to working with HHS through ONC to collaborate on and advance the development, adoption and implementation of HIT and technical standards related to health information exchange. DoD has continued its active support of ONC efforts by contributing to the ONC HIT Policy Committee, ONC HIT Standards Committee, FHA Managing and Lead Partners Council and Leadership Council, and HITSP initiatives.

##### 1. *HIT Policy Committee*

ARRA required that the HIT Policy Committee be created under FACA. The Committee's purpose is to make recommendations to ONC on a policy framework for the development and adoption of a nationwide health information infrastructure, including standards for the exchange of patient medical information. DoD representatives are working with the HIT Policy Committee as it formulates a recommended definition of "meaningful use" for the exchange of electronic health information.

##### 2. *HIT Standards Committee*

ARRA further required the creation of the HIT Standards Committee to make recommendations to ONC on standards, implementation specifications, and certification criteria for the electronic exchange and use of health information. DoD representatives participate in the HIT Standards Committee and its work groups to identify HIT standards and data elements required for "meaningful use." Initially, the HIT Standards Committee will focus on the guidelines developed by the HIT Policy Committee to establish "meaningful use" standards.

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### **3. *National Committee on Vital and Health Statistics (NCVHS)***

Since 1949, the National Committee on Vital and Health Statistics (NCVHS) has provided advice in the areas of health data, statistics and national health information policy. NCVHS continues to provide advice and assistance to the HHS Secretary, and now serves as a forum for interested private sector groups to discuss key health data issues. As part of this effort, DoD has contributed lessons learned and best practices for implementing EHRs and sharing health information. The Department has also collaborated with FHA to articulate the federal perspective on “meaningful use” requirements, presented at NCVHS Executive Subcommittee hearings held April 28-29, 2009.

### **4. *American Health Information Community (AHIC)***

From 2005 to 2008, the American Health Information Community (AHIC) advised the HHS Secretary and recommended specific actions to achieve a common interoperability framework for HIT. DoD representatives contributed to AHIC work group recommendations related to EHRs; confidentiality, privacy and security; chronic care; quality; population health; consumer empowerment; and personalized healthcare. As an advisory committee, AHIC collaborated with stakeholders to prioritize HIT needs and harmonize HIT standards. In 2009, as in previous years, DoD reviewed several AHIC use cases, and commented to ONC on extensions or gaps in general laboratory orders, medication, clinical encounter notes, order sets, common device connectivity, common data transport, consumer adverse event reporting, pre-authorization of treatment, payment, operations and newborn screening. DoD also contributed to the development of a new use case scenario for clinical research and use of electronic health information in research. The focus was to identify additional functional needs for health information exchanges and to support the adoption of harmonized HIT standards and capabilities as part of the national HIT agenda.

DoD continued to collaborate and coordinate with AHIC through its sunset, and with the other federal health agencies through the federal Interagency Interim Coordination Group. Since ONC’s announcement of the creation of the HIT Policy and Standards Committees in May 2009, DoD has supported and engaged the Committees in setting strategic objectives for the national HIT agenda.

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### **B. FHA E-Government Line of Business**

Led by HHS, FHA and over 20 federal partners are helping to build a federal HIT environment supporting interoperability among state, local, tribal and private sectors. The group's objective is to improve quality of care, access to care, efficiency of delivery, and overall health. By providing support and guidance, FHA helps advance the national HIT agenda.

DoD is a lead partner in the FHA e-Government Line of Business. For years, DoD has supported FHA's efforts to facilitate information sharing among agencies. Pursuant to an Interagency Agreement between DoD and HHS, DoD provides resources, subject matter expertise, architectural products and services to support FHA's work. DoD has been a key participant in FHA activities, including:

- promotion and determination of federal HIT modeling and standards
- promotion of the federal NHIN CONNECT open source health information exchange software for the exchange of health information with other federal partners and private sector NHIN participants
- publication and working with SDOs on federal standards priorities
- federal HIT investment planning and guidance
- establishment of a federal health information/knowledge sharing environment, and
- development of federal open-systems architecture

DoD, in concert with the FHA program office, continues to foster health information interoperability and to expand the ability to share health information with other federal agencies and private sector healthcare organizations.

### **C. Nationwide Health Information Network (NHIN)**

ONC has facilitated development of NHIN, a "network of networks," to provide a secure, nationwide, interoperable health information infrastructure for providers, consumers, health information exchanges, government health facilities, payors, laboratories, pharmacies, and others who support health and healthcare. NHIN provides a mechanism for previously disconnected systems and exchanges to connect and share data, which will help improve quality, value and affordability of health and wellness services.

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Operating within clearly defined specifications, agreements and policies, NHIN seeks to achieve its goals by:

- developing capabilities for standards-based, secure data exchange nationwide
- improving the coordination of care information among hospitals, laboratories, physicians' offices, pharmacies and other providers
- ensuring appropriate information is available at the time and place of care
- ensuring that consumers' health information is secure and confidential
- giving consumers new capabilities for managing and controlling their Personal Health Records (PHRs) as well as providing access to their health information from EHRs and other sources
- reducing risks from medical errors and supporting the delivery of appropriate, evidence-based medical care, and
- reducing healthcare costs resulting from inefficiencies, medical errors and incomplete patient information

ONC has awarded grants to 15 health information exchanges to form an NHIN Cooperative and begin trial implementations of NHIN. DoD, VA, the Indian Health Service, the Social Security Administration and other federal health agencies formed the federal NHIN CONNECT collaborative to be active partners in the NHIN Cooperative. In September 2008, December 2008 and April 2009, the federal collaborative demonstrated its ability to share health information with the private sector using NHIN. With more than 70 percent of DoD's health care delivered in the private sector, it is vital for NHIN to reach private sector partners.

The CONNECT software solution is built on open source technology, using interoperability standards recognized by the Secretary of HHS. It enables secure and interoperable electronic health information exchanges with other NHIN participating organizations. The CONNECT gateway has three primary components:

- Core Services Gateway enabling an NHIN participant to locate a patient at another NHIN health organization, request and receive documents associated with the patient, and record these transactions
- Enterprise Service Components providing robust tools and components, such as a Master Patient Index, to support electronic health information exchange
- Software Development Kit enabling agencies to develop adapter components that integrate existing electronic health information systems with the Core Services Gateway

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CONNECT will replace point-to-point solutions; standardize interfaces and reduce overall costs; and improve health information sharing with federal and private sector partners. Federal agencies have collectively built a collaborative solution that will speed the adoption of HIT and enhance continuity of care. DoD will continue to pursue enhancements, pilots and limited production implementation of CONNECT in 2010.

### **D. DoD/VA Virtual Lifetime Electronic Record (VLER) Project**

On April 9, 2009, President Barack Obama along with the Secretaries of Defense and Veterans Affairs announced that DoD and VA “will work together to define and build a system that will ultimately contain administrative and medical information from the day an individual enters military service throughout their military career, and after they leave the military.” The DoD/VA VLER project will track a soldier’s lifelong medical, personnel and benefits history, beginning the date of entry into the Service, thereby improving the flow of information between the Departments. The objectives of VLER are to:

- further the development and adoption of national standards
- use a non-proprietary, standards based SOA, and
- access data through the NHIN federal gateway

A significant health data sharing gap to be addressed is the sharing of electronic health information with DoD and VA private sector partners. This is a primary focus of the VLER and NHIN initiatives. As plans for VLER mature, it is anticipated that technical approaches or initiatives to resolve many information sharing gaps will evolve, be agreed to by the Departments, be funded and scheduled, and move into a future version of the VA/DoD JSP and tracked for implementation.

In the fourth quarter of FY 2009, the Departments were in the initial stages of developing the specific data-sharing requirements and synchronizing schedules. The first increment of the VLER effort involves use of NHIN to begin sharing electronic health information in a limited number of sites; and the creation of production pilots with the incremental extension of available content using NHIN approved documents and standards. To establish the baseline capabilities required to realize the long-term VLER mission, it will be developed in multiple overlapping subphases or segments. Each segment will have overlapping initiatives, with completion dates set approximately every six months. By staggering the effort in this manner, each initiative may capitalize on evolving capabilities and lessons learned from other initiatives. The Departments will oversee and coordinate initiatives, to ensure achievement of objectives in the long-term VLER mission.



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### **E. Health Standards Development and Adoption**

Uniform standards must guide HIT, informatics and interoperability. Standards development requires collaboration among myriad organizations involved the delivery of healthcare. Standards development also requires coordination with existing standards and SDOs.

DoD and VA continue to champion health standards development, convergence, harmonization and adoption. Through FHA, DoD and VA recently documented and gained consensus on a Federal Strategy for Health IT Standards Organization Participation and Engagement Plan. The Departments also participate in numerous health SDOs, including:

- HITSP
- Health Level Seven, Inc. (HL7)
- National Council for Prescription Drug Programs, Inc., for drug utilization reviews
- LOINC
- American National Standards Institute Accredited Standards Committee X12 Subcommittee N (ANSI X12N), for HIPAA 5010 compliance
- Organization for the Advancement of Structured Information Standards, and
- Digital Imaging and Communication in Medicine (DICOM), for distributing and viewing radiological images and standardizing radiological document nomenclature

DoD has worked with major health SDOs to eschew text-based standards documentation in favor of unified modeling language notation. The new methodology, which facilitates systems design and engineering, has been embraced by HITSP in its way forward. Both DoD and VA work on HITSP tiger teams to integrate health standards use cases and provide cross reference standards methodologies to display common business processes through a model-driven architecture approach. The Departments' efforts support "meaningful use" and electronic health information sharing under ARRA.

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Since 2000, DoD and VA have collaborated with federal stakeholders to:

- identify relevant, appropriate standards
- monitor activity of SDOs
- actively promote federal requirements and needs
- coordinate federal standards issues and collaborate with the broader health community
- evaluate use of new or harmonized standards and assist in testing for implementation, and
- leverage vast experience implementing existing standards to impact future standards development

Through continued collaboration, the Departments have developed a DoD/VA target health standards profile that aligns with recognized national HIT standards; a health interoperability standards reference model; and a shared health architecture plan to promote mature health standards in design and development of new capabilities.

Through collaboration on inpatient services, DoD and VA have advanced a joint HL7 and Object Management Group<sup>®</sup> Healthcare Services Specification Project toward a set of service-aware principles; and a SOA reference model for EHR, known as the HL7 Service-Aware Enterprise Architecture Framework. The Departments have also initiated a federal health interoperability modeling and standards work group to produce logical health information model to support semantic interoperability.

DoD must ensure that new standards provide a common set of information, data, security and technical requirements that support interoperability and health information sharing across organizational boundaries. Standards have been chosen by consensus for laboratory results reporting, continuity of care documentation, medications, allergies, imaging, consumer access to clinical information, quality, emergency first responder access to clinical summary data, vital signs, dental codes, immunizations, diagnosis and problem lists, and security and privacy.

The need for standards will continue to evolve, so development and adoption of new standards must also continue. The Departments will move ahead in close collaboration, seeking common standards and greater healthcare interoperability.

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### **F. Data Feeds to Centers for Disease Control and Prevention (CDC)**

BioSense is an initiative of Centers for Disease Control and Prevention (CDC) to support enhanced early detection, quantification and localization of possible biologic terrorism attacks and other events of public health concern on a national level. CDC wants to expand the types of data received from DoD to include inpatient data; emergency department data; census information; laboratory orders and results; radiology orders and results; and pharmacy orders. CDC desires near-real-time receipt of data as it is triggered in the source system. This new data would replace the Composite Health Care System (CHCS) Standardized Ambulatory Data Record (SADR) outpatient batch feed currently sent from DoD to CDC. DoD has identified the data elements requested by CDC; discussions on potential implementation are ongoing.

### **G. MHS Business-to-Business (B2B) Gateway**

The MHS B2B Gateway was established in September 2003 to serve TRICARE Managed Care Support (MCS) contractors. This gateway provides a pathway for the electronic exchange of healthcare data between more than 40 commercial partners and select DoD locations, including the Defense Manpower Data Center (DMDC), Defense Finance and Accounting Service (DFAS), and MTFs. More than 2,000 users access data for myriad tasks, such as verifying healthcare eligibility of beneficiaries, filing claims and conducting remote maintenance of healthcare programs and systems.

In July 2009, TRICARE announced the third generation (T-3) of MCS contracts for the North, South and West TRICARE regions in the United States. Two of the three contracts are new, and the transition from current contracts must ensure the seamless flow of data. Delivery of healthcare under the new contracts is expected in FY 2010. Before healthcare delivery begins, each MCS contractor's network must pass a stress test that demonstrates that the network can handle and process the anticipated levels of data traffic.

The T-3 contracts feature financial incentives to encourage exceptional customer service; high-quality care; detection of fraud, waste and abuse; increased electronic claims processing; better program management; and improved preventive care and cost savings. To apply these incentives fairly, TRICARE has improved methods to measure and assess network provider, beneficiary and MTF commander satisfaction.

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### **V. MHS MEDICAL INFORMATICS DECISION MAKING TOOLS**

MHS continues as a leader in the development and maintenance of medical informatics decision making tools. Innovative tools with active interfaces around the world are used to collect, integrate, analyze and present medical and administrative information; findings are applied to improve the performance of MHS through clinical support, medical logistics and business resources. The Defense Health Services System (DHSS) builds or maintains 28 products in three major areas: clinical support, medical logistics, and resources. DHSS products help detect and contain the spread of disease across the world, manage the delivery of pharmaceuticals and medical supplies worldwide, and track billions of dollars annually in healthcare services to MHS beneficiaries.

A key achievement for DHSS in FY 2009 was the physical migration of its largest technical infrastructure from one secure location to a new secure location, on time and on budget. The move cost \$28 million and relocated 10 DHSS applications and 300 terabytes of data onto 22 new servers in less than nine months. This doubled the relative performance computing power onto a smaller physical and energy consumption footprint without interrupting service to thousands of DHSS users worldwide. It also moved a global automated medical surveillance system and a global business intelligence and analysis network used to manage TRICARE's \$39 billion global healthcare system, which processes one million claims per day. Results of the migration show substantial improvements in data loading and processing times, particularly for MDR and M2.

Examples of diverse MHS medical informatics decision making tools follow.

#### **A. Clinical Support**

##### ***1. Centralized Credentials Quality Assurance System (CCQAS)***

CCQAS is a Web-based informatics tool that supports medical personnel readiness by providing authorized users with the capability to manage provider credentials and privileges, malpractice and disability claims, and adverse actions or investigations of physicians, dentists, nurses, pharmacists and other medical support personnel who work in military hospitals and clinics worldwide, including within Theater.

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## 2. *Clinical Data Mart (CDM)*

CDM is the Web-based clinical reporting tool for DoD's EHR system. Built on a robust, scalable COTS architecture, CDM allows MTF clinicians and analysts worldwide to review large data samples from the CDR through a secure Web interface. CDM's benefits include:

- providing aggregate, structured and secure AHLTA data
- enabling better patient management
- displaying clinical data relevant to business decisions
- securing storage/access of a 500 gigabyte database with over 90 million patient records
- returning data queries in seconds instead of hours or days, and
- reporting secure, actionable data and identifying deficiencies for further investigation

CDM is a vital tool in MHS's arsenal to provide excellent healthcare to its beneficiaries, leveraging the latest electronic health informatics available. The impact of CDM is evident across DoD, as providers improve the quality, safety and efficiency of direct patient care, wellness, disease prevention and disease management. Army, Navy and Air Force share information between health teams and publish common clinical reports. CDM generates reports across MHS from enterprise-level to individual patient-level. The tool has been used to:

- ensure vaccine compliance in high-risk groups
- identify undiagnosed patients at risk for chronic kidney disease
- notify patients at risk from a national vaccine recall in hours rather than weeks
- monitor entire panels of diabetic patients using an "at-a-glance" dashboard of trends including blood pressure, hemoglobin A1c levels and body mass index
- generate disease management reports
- improve clinical documentation
- track medical readiness, and
- deliver surgical outcomes analysis

Future initiatives include access to CDM outside of AHLTA, new data elements, a new data model to enhance and improve reporting, and new public reports for providers and specialty caregivers.

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MHS has received accolades for the development of CDM. In October 2008, *Government Computer News* awarded an Honorable Mention for Outstanding Information Technology Achievement in Government. In June 2009, the *Computerworld* Honors Program designated CDM as a Laureate Award winner and a Finalist for its 21st Century Achievement Award in Healthcare.

### **3. *Enterprise Wide Scheduling and Registration (EWS-R)***

EWS-R provides inpatient and outpatient appointing, scheduling and beneficiary registration functions across MHS. The graphical user interface provides a multiple sponsorship view, enhanced Defense Enrollment Eligibility Reporting System (DEERS) registration capabilities, and calendar-based scheduling of dental appointments. A key benefit of EWS-R is its ability to reduce duplicate patient registrations.

### **4. *Nutrition Management Information System (NMIS)***

NMIS is a fully integrated nutrition management system that supports military personnel readiness worldwide. This clinical and production information system enables MHS dietetics personnel to provide preventive and therapeutic medical nutrition therapy and medical food management to MHS beneficiaries.

### **5. *Patient Safety Reporting (PSR)***

MHS expects PSR to deliver an automated patient safety event reporting application to identify areas for patient safety improvement. PSR will enable MHS to monitor and evaluate patient safety events, and aggregate and standardize patient safety reporting across MHS. PSR will also provide a systematic methodology to reduce the frequency and severity of medical events and help identify MHS-wide safety improvement strategies. PSR deployment is expected to begin in early 2010.

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### 6. *Special Needs Program Management Information System (SNPMIS)*

SNPMIS is the automated information system designed to ensure DoD meets the unique information requirement associated with implementation of the Individuals with Disabilities Education Act of 2004 (IDEA). IDEA requires the provision of early intervention services for developmentally-delayed children, from birth through age two years. It also requires the provision of medically related education services for developmentally delayed individuals, ages three to 21 years. SNPMIS provides access to a comprehensive program of therapy, medical support and social services for young MHS beneficiaries with special needs.

### 7. *TRICARE Online (TOL)*

TOL (<https://www.tricareonline.com/welcome.do>) is a secure Web portal designed to increase access to care for authorized TRICARE beneficiaries and increase access to information for designated TRICARE physicians and support staff. Round-the-clock access to TOL information and services empowers and involves beneficiaries in care management, and improves the patient experience. Using TOL, TRICARE beneficiaries schedule or cancel primary care and self-referral appointments online, eliminating telephone wait times and improving clinic “no show” rates.

TOL links beneficiaries to comprehensive information on TRICARE pharmacy benefits and gives them access to the TOL Prescription Refill feature. Using this feature, beneficiaries refill and check the status of prescriptions online. Beneficiaries with a Common Access Card (CAC) have secure, read-only access to the medication profile stored in their EHR. TOL empowers beneficiaries by linking them to TRICARE Prime enrollment resources like the Beneficiary Web Enrollment Web site, where active duty service members, retirees and their families securely manage TRICARE Prime enrollments online.

Beneficiaries with a CAC may also access the TOL PHR application for secure, read-only access to their current EHR data. PHR modules include Personal Information (EHR demographic, contact, eligibility and other health insurance data); Health History (EHR allergy and medication data); Medication Profile (documented prescription history from available sources including MTFs, retail pharmacy, TRICARE Mail Order Pharmacy, and VA, if applicable); Allergy Profile (documented allergy history); and a Personal Health Summary based on all available PHR data. As MHS business processes are refined, additional capabilities will be added to the TOL PHR application, further empowering beneficiaries to be active participants in their healthcare.

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In addition to beneficiary focused capabilities, the TOL portal provides overseas MTFs with capabilities designed to create efficiencies in patient administration. TOL includes a Non-Availability Statements feature that provides the only electronic means for TRICARE Overseas MTFs to send referral information to the MHS Fiscal Intermediary. This feature improves claims processing and the efficiency of sending payments for services to beneficiaries.

### **B. Medical Logistics**

#### **1. Common User Database (CUD)**

CUD is an automated application incorporating the Defense Medical Standardization Board's clinical advisory board selection process into a coordinated and standardized business process. CUD is designed to map the clinical workflow processes associated with the selection of standardized medical surgical items, medical equipment and pharmaceuticals for the overall treatment of injuries in wartime or contingency environments. CUD's database supports standardization of material. Standardized data exchange with the medical clinical/logistics community enables optimal interoperability for medical readiness.

#### **2. Defense Blood Standard System (DBSS)**

The mission of Armed Services Blood Program Offices (ASBPOs) is to provide quality blood products, blood substitutes, and services for all worldwide DoD customers in peacetime, in wartime, and during contingency operations. DBSS is the automated information system used by blood program offices to maintain and track blood donations and blood product inventories. It provides blood product management for fresh and frozen blood products during blood collection, processing, testing, shipping and storage, as well as transfusion service management and system administration capabilities.

DBSS integrates information technology into the daily business practices of the military blood community and automates the exchange of blood products with our nation's allies and civilian agencies. DBSS's automated capabilities include blood donor management; blood product management during creating, testing, inventory, shipment, patient/transfusion service management; a full Human Immunodeficiency Virus and Human T-Lymphotropic Virus lookback system; and system administration. DBSS operates in MTFs, Armed Services Whole Blood Processing Laboratories, blood product depots, blood donor centers, mobile blood donor facilities; DBSS is also being deployed to Service Theater sites.



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DBSS is unique as the only automated MHS information system that is regulated by the Food and Drug Administration (FDA) as a Class II Medical Device. The Class II Medical Device designation gives FDA authority to inspect the development and use of DBSS.

New ASBPO requirements received from United States Central Command and Combatant Command surgeons and others have detailed desired enhancements for blood management. MHS looks forward to transitioning to a commercial blood informatics system that is integrated with clinical documentation and tracking. The DBSS phase-out is slated for the third quarter of FY 2010 through the first quarter of FY 2012.

### **3. *Defense Medical Logistics Standard Support (DMLSS)***

DMLSS is the DoD standard medical logistics application for delivery of cost-effective, state-of-the-art healthcare to patients worldwide. DMLSS automated information system enhances healthcare delivery in peacetime and promotes wartime readiness and sustainability. DMLSS delivers automated support of reengineered medical logistics business practices and offers a comprehensive range of material, equipment and facilities management capabilities.

MHS plans to migrate the DMLSS legacy systems to enterprise wide logistics architecture by 2012. The integrated, interoperable system will:

- facilitate data and capability sharing in a secure manner
- standardize security by avoiding point-to-point connectivity
- improve reuse of service-based system customizations
- reduce total costs of ownership by maximizing reuse
- avoid single points of failure prevalent with centralized systems, and
- offer a cost-effective transition to industry best practices without interruptions in service

### **4. *Defense Occupational and Environmental Health Readiness System—Hearing Conservation (DOEHRS-HC)***

DOEHRS-HC provides noise exposure surveillance, diagnostic evaluation, and management of auditory pathology, hearing loss and injury referrals, including auditory readiness and medical outcomes documentation capabilities.

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### 5. *Defense Occupational and Environmental Health Readiness System—Industrial Hygiene (DOEHRS-IH)*

DOEHRS-IH supports the capture of workplace and environmental exposure information, viewing of industrial hygiene decisions, viewing of environmental laboratory results, and tracing of air, water and soil environmental hazards in garrison and Theater operations.

### 6. *DMLSS Customer Assistance Module (DCAM)*

DCAM is a medical logistics ordering tool through which users view a supplier's catalog and generate electronic orders. The product focuses on the Theater environment, automates the Class VIII supply process at lower levels of care, and allows non-logisticians to download catalog data, place orders and obtain status information.

### 7. *DoD/VA Data Synchronization*

DoD/VA Data Synchronization links, standardizes and synchronizes product data from the medical supply chain, including healthcare facilities and suppliers. It gives DoD MTFs and VA facilities easy access to product price data, allowing them to compare vendors' prices and purchase products offered at a lower price. As of FY 2009, the aggregate cost avoidance exceeded \$30 million.

### 8. *Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE)*

ESSENCE is a Web-based medical surveillance tool that automatically screens MHS worldwide for rapid or unusual increases in the occurrence of certain medical syndromes. Developed by DoD, Walter Reed Army Institute of Research and Johns Hopkins University Applied Physics Laboratory, ESSENCE is the only near-real-time global monitoring system for detecting and monitoring infectious disease outbreaks, such as the worldwide outbreak of H1N1 flu. ESSENCE captures all outpatient diagnoses from MHS and assigns certain diagnoses to predefined infectious disease syndromes. Primary ESSENCE users are MHS epidemiologists and public health officers.

ESSENCE receives and analyzes data from 90,000 to 100,000 daily outpatient and emergency department visits in DoD healthcare facilities worldwide. ESSENCE reviews MTF data and identifies patterns and trends that might indicate the presence of an infectious disease. In cases requiring further investigation, ESSENCE users alert local and state public health officials and CDC's BioSense System. The application is also a part of the National Pandemic Influenza Preparedness and Response Plan.

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ESSENCE features several automated reporting enhancements, including ingesting, detecting and reporting on laboratory and radiology orders data from CHCS-based SADR data feed. Additional enhancements include user defined syndromes and user friendly site selection capabilities. These enhancements exemplify continuing efforts of military clinicians to support MHS beneficiaries, and they secure for ESSENCE a vital role in protecting military facilities and enhancing the US national public health surveillance system.

To track and report on the H1N1 outbreak worldwide, MHS uses ESSENCE medical surveillance, JMAR, and the MHS Data Repository. MDR feeds raw anonymized SADR to CDC every four hours, every day of the week. Epidemiologists and public health experts use ESSENCE to report increases in red and yellow alerts for several medical syndromes, including respiratory, influenza-like illness, fever and gastrointestinal distress. CDC uses SADR data feed for the BioSense/National Pandemic and Influenza Response Program and for reporting in the Morbidity and Mortality Weekly Report, which can be accessed at [www.cdc.gov/mmwr/about.html](http://www.cdc.gov/mmwr/about.html).

HEC approved the medical surveillance team's proposal for a Joint Incentive Fund initiative between DoD and VA biosurveillance programs. The two-year project, funded at over \$4.8 million, will link the Departments' biosurveillance programs to collaborate on analysis of surveillance data, improve information sharing and increase situational awareness of national disease outbreaks, accidental environmental exposures and acts of terrorism. Both will have access to joint de-identified data sets for analysis, which is expected to strengthen the predictive capabilities of the nation's biosurveillance systems. This project also satisfies portions of the National Biosurveillance Integration System initiative, Pandemic Flu Act of 2007, and Homeland Security President Directive-21 requiring linkage of federal agency biosurveillance capabilities.

The project will be delivered in three phases over the next two years. Phase I will exchange current data streams that the Departments provide to CDC's BioSense system. Phase II will evaluate the improved performance of ESSENCE for public health purposes using these expanded data sets. Phase III will develop a DoD/VA biosurveillance backup data repository so the Departments can serve as disaster recovery sites for each other.

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FY 2009 also brought improvements to ESSENCE performance and interagency planning for future enhancements to surveillance and reporting capabilities. In October 2008, the ESSENCE server environment was moved to a new secure location resulting in significantly improved performance. Before the move, ESSENCE averaged two to four ingest cycles every 24 hours. Now, ESSENCE updates its database 8 to 10 times every 24 hours, a data timeliness increase of 150 to 300 percent. Several automated tools were also implemented within ESSENCE to help improve users' productivity, including scripts to monitor and electronically notify users about outages, downtimes and password reminders.

### ***9. Joint Medical Asset Repository (JMAR)***

JMAR delivers total visibility of DoD wide medical asset data. The Web-based application delivers access to integrated joint-service medical asset information to any user, any time, on any machine. JMAR's Web-based pandemic dashboard helps quickly locate medical supplies in a crisis through total visibility of DoD wide medical asset data. DoD recognizes JMAR as the single integrated and authoritative source for joint medical logistics information provided to the Joint Total Asset Visibility system.

### ***10. Patient Movement Items Tracking System (PMITS)***

PMITS manages a pool of mobile medical equipment used to support patients during aeromedical evacuations. The system provides real-time information on the operational status and location of patient movement items, ensuring that the right equipment is present at the right time. Marrying inventory tracking and logistics, PMITS has substantially decreased inventory costs and improved operational readiness for aeromedical evacuations. The system is intended for use by Army, Air Force, Navy and Marine Corps, for peacetime, contingency and wartime operations. It has been deployed to support troops in Kandahar, Afghanistan. Currently PMITS is in more than 100 sites worldwide, including 61 peacetime, 18 Theater, 9 training and 16 rapid deployment sites.

### ***11. Radio Frequency Identification (RFID) Pilot Program***

In 2008, MHS launched an RFID pilot program in the National Capital Area. RFID technology permits electronic tracking of medical and surgical supplies. The pilot program uses RFID tags to improve receipt processing times, time spent on data entry, inventory discrepancy resolutions, sorting goods and verifying quantities. Preliminary results from the first pilot site—DeWitt Army Community Hospital, Fort Belvoir—are positive. If the pilot continues to show time savings, MHS plans to extend the use of RFID to National Naval Medical Center, Bethesda, Maryland and Malcolm Grow Medical Center, Andrews AFB, Maryland.

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### C. Resources

#### 1. *Coding and Compliance Editor (CCE)*

CCE uses expert coding and editing tools to improve coding accuracy for inpatient and outpatient services rendered, and to optimize reimbursement.

#### 2. *Defense Medical Human Resources System-Internet (DMHRSi)*

DMHRSi integrates human resources data from a variety of sources and gives centralized access to workforce information, including personnel, labor cost assignment, education, training and personnel readiness information for designated Active Duty, Guard and Reserve, Federal Civilians, contractors and volunteers. DMHRSi also provides personnel asset visibility to MHS leadership, identifying personnel, where they are working, where they are authorized, what positions are filled, what positions are vacant, projected gains or losses, what training staff has received, the hours charged to each work center and to particular tasks, and roll-up reporting capabilities. As of September 2009, DMHRSi is fully deployed to Navy sites, and is deployed approximately 98 percent to Army sites and 65 percent to Air Force sites.

#### 3. *Duplicate Claims System (DCS)*

Each year, DCS examines accounting data and identifies \$7 to \$12 million in duplicate claims paid to medical providers. After electronic identification of potential duplicates, DCS staff members contact medical providers and confirm the overpayment. Amounts recovered are credited to MHS. Past iterations of DCS existed on client server networks, requiring occasional manual upgrades to software. MHS now uses a secure Web version of DCS through the PEPR portal. With the new technology, maintenance and upgrades to DCS do not require action by individual users.

#### 4. *Enterprise Wide Provider Database (EWPD)*

EWPD provides MHS an electronic means to transmit standard personnel data from authoritative systems to need-to-know systems. This supports the need to standardize data across MHS, thus improving data consistency and quality and reducing duplicate data entry.

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### **5. *Expense Assignment System (EAS)***

EAS is a cost allocation tool that provides standardized reporting of workload, expense and workforce data. It enhances healthcare resource management and decision making at all levels of MHS. In EAS, a modern, sustainable Oracle database replaced an aging Informix database.

### **6. *Managed Care Forecasting and Analysis System (MCFAS)***

MCFAS is the official source of population forecasts for MHS planning and budgeting. MCFAS provides DoD executives with accurate past, current and future counts of people eligible for MHS medical benefits, globally or within individual zip codes. MCFAS data helps users anticipate future beneficiary obligations, analyze the impact of potential market area modifications, and determine types of medical services needed around the world. MCFAS data also helps users develop market area business plans, determine the effects of direct care provider availability and productivity levels on enrollment capability, and evaluate the loss of primary care capacity due to deployments, facility closures and access issues.

The new version of MCFAS includes historic data from FY 1995 through FY 2008 and forecasts from FY 2009 through FY 2015 in the MCFAS Beneficiary Population Forecasting Model (BPFM). It also adds the ability to build custom reports in the MCFAS Custom Market Area Tool. In the future, MCFAS will add a Web-based Geographic Analysis Dashboard for spatial analyses and queries of the Geographic Analysis Tool and Custom Market Area Tool. BPFM will also accommodate predefined Service-approved, contingency forecasts.

### **7. *MHS Data Repository (MDR)***

MDR is MHS's centralized data repository and is populated with clinical encounter and cost data from MTFs as well as purchased care data from contracted MHS network providers. MDR captures and validates data from more than 260 DoD health data networks worldwide. This robust repository offers more than five billion records online, representing more than ten years of data. MDR is MHS's single point for data integration, data quality edits, on-line and near-line data storage and DoD healthcare data transfers.

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MDR allows the seamless transfer of more than 100 terabytes of data to military data analysts at remarkable speed and volume, and provides unprecedented capabilities to MHS. Projects that previously required weeks or months for data collection, analysis and reporting now require only days or minutes. Defense Manpower Data Center feeds demographic data to MDR, revealing not only the geographic locations of eligible beneficiaries but also their history of health plan enrollment. A nearly continuous stream of laboratory, radiology and pharmacy data populates MDR with detailed results that make it one of the most clinically rich data repositories in existence today. For FY 2009, the count of records processed by MDR is expected to reach 46 billion, a 2,000 percent increase over FY 2008.

MDR consolidates data from multiple systems supplying financial, logistical, clinical and personnel data. It includes inpatient, outpatient, pharmacy, ancillary, provider and purchased care data from different military services, healthcare providers, beneficiary groups, geographical regions and other elements. It also incorporates raw data to support standard and customized analyses. MDR identifies the quality of data it receives, assures that all data is available for analysis and reporting, and assures that data from disparate sources is current. MDR feeds several data mart applications and controls access to Protected Health Information (PHI) in accordance with HIPAA privacy regulations. MDR helps provide interagency data sharing capabilities with VA and CDC. Additionally, MDR preserves historical raw data by type and year for *ad hoc* analysis.

MDR incorporates healthcare information management capabilities of COTS systems and facilitates analysis and projection by combining reporting tools with search and selection, *ad hoc* graphics, drill-down and narrative functions. MDR also provides executive information and decision support for secured electronic healthcare data for MHS beneficiaries, from the enterprise level down to the individual recipient of care.

### 8. *MHS Insight*

In 2005, MHS introduced *MHS Insight*, an online performance management tool, to facilitate best practices for improved business performance management. MHS front-line managers and executive staff use *Insight* and its specialized scorecards, dashboards, paths and plans to set and track:

- health quality standards
- Wounded Warrior care
- access to care
- continuity of care
- pay for performance

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- customer confidence, and
- cost management

*Insight* combines the perspectives of executives; quality and operational management; patients; operational staff; and senior management. The tool's 211 performance measures allow all levels of MHS to see their performance relative to any MHS unit worldwide.

The MHS Office of Strategy Management coordinated development of *Insight's* metrics with the Services, Health Affairs and TRICARE Management Activity. *Insight* extracts information from disparate MHS business processes; and without disrupting operations, gives senior leadership and front-line management access to information from an operational view, a patient perspective and a strategic management view.

With *Insight*, MHS is reducing costs, improving patient satisfaction, and identifying quantifiable ways to improve health. For instance, *Insight* reported:

- MHS exceeds the national average for influenza immunizations, but falls short of DoD and Healthy People 2010 goals, and
- MHS ranks above the 50<sup>th</sup> percentile in all Healthcare Effectiveness Data and Information Set measures

With *Insight*, MHS leaders can see instantly how to improve and standardize transparent measures of quality and cost across time. *Insight* measures and maintains accountability for population health needs and status, and establishes targets for cost. MHS now aligns payment and financing incentives to reward achievements; for instance, MHS invests in pay for performance, and rewards facilities that quantify preventive health measures in *Insight* (e.g. vaccinations, pap smears and blood glucose tests).

As of September 2009, *MHS Insight* is used worldwide at more than 70 hospitals and 400 clinics, by more than 600 total users. Over time, MHS expects the total number of users to grow to 3,000 to 4,000.



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### 9. *MHS Learn*

*MHS Learn* is an enterprise training delivery and management system integrated with DMHRSi, with an expanding library of more than 1,800 medical-related course offerings. In partnership with VHA, *MHS Learn* launched a free portal to expand learning opportunities for MHS staff, active duty personnel, beneficiaries and Veterans. The Learning Portal offers self-education and training, including continuing education courses, staff development, systems training and wounded warrior care; it also offers training on subjects such as asthma, diabetes management, hypertension, mental health, and post-traumatic stress disorder (PTSD). A Civilian Provider Portal offers free training to mental health providers worldwide, instructing them how to recognize PTSD and traumatic brain injury (TBI) in patients who are active duty military or Veterans. Developed as a six-month pilot using *MHS Learn*'s existing technologies, DoD/VHA teams delivered the Civilian Provider Portal, from concept to implementation, in less than 90 days. CONOPS projected that 200 mental health providers would access training during the pilot. The response exceeded expectations, with 700 providers participating in the pilot training and nearly 300 more enrolling each following month.

### 10. *MHS Management Analysis and Reporting Tool (M2)*

M2 is an *ad hoc* query tool used by healthcare analysts and decision makers to manage and oversee MHS operations. M2 provides summary and detailed views of population, clinical and financial data from all MHS regions worldwide and includes MTF and purchased care data with eligibility and enrollment data. Healthcare analysts use M2 to perform trend analyses, to conduct patient and provider profiling studies and to identify opportunities for transferring healthcare from the private sector back to MTFs. In order to provide more timely data, the frequency of some M2 data feeds has increased from monthly to weekly or from weekly to daily.

The M2 database exceeds 2.5 terabytes. A new local area network for M2 has been built on modern architecture and hardware designed to optimize large-scale data warehouse transactions. The new network topology has significantly decreased data delivery delays, resulting in quicker, more reliable query responses for M2 users.

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### ***11. Patient Encounter Processing and Reporting (PEPR)***

PEPR, a Web-based suite of applications, enables analysis of the purchased care claims and encounter data generated by TRICARE managed care support contractors. PEPR's key applications are the Purchased Care Utilization, Reporting and Evaluation System (PCURES) and PCDIS. PEPR also features *ad hoc* reports and applications including the Web-based Duplicate Claims System (DCS). PEPR uses purchased care claims data collected by TED, and provides streamlined access to both TED and Healthcare Service Records. PEPR data assists in analyzing and reporting purchased care costs and workload, resource sharing opportunities and potential savings for MTFs.

### ***12. Prospective Payment System (PPS)***

DHSS deployed PPS in October 2008. PPS is an automated Web-based system that directs a performance-based budgeting system for MHS to provide incentives and financial rewards for efficient management. PPS allows MHS to establish MTF budgets based on actual workload production for direct care such as hospital admissions, prescriptions filled and clinic visits, rather than historic resource levels.

### ***13. Protected Health Information Management Tool (PHIMT)***

PHIMT is a Web-based tracking tool that stores information about PHI disclosures, authorizations and restrictions. PHIMT is an automated system that mirrors HIPAA regulations. It allows patients to request PHI about themselves and permits agencies to request PHI on a specific patient. PHIMT records PHI disclosures, including access requests, suspensions, complaints, authorizations and restrictions.

### ***14. Purchased Care Data Warehouse (PCDW) and Purchased Care Detailed Information System (PCDIS)***

PCDW is a single repository of more than 10 years worth of claims-related data. PCDIS facilitates claims review through data fields such as provider name, beneficiary name, internal control/claim number, and fiscal year data summaries. Combining all data in a single repository allows users to run complex inquiries to identify aberrant billing patterns.

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The MHS Program Integrity Office (PIO) uses PCDW and PCDIS to investigate healthcare fraud within MHS. In a recent case, MHS PIO and its subcontractor, Wisconsin Physician Services, used these tools to identify substantial false claims emanating abroad. A five-year investigation culminated in a 75-count indictment, guilty pleas and recovery of more than \$100 million for MHS, the largest fraud settlement in TRICARE history. In November 2008, MHS PIO and Wisconsin Physician Services won an Investigation of the Year Award from the National Healthcare Anti-Fraud Association.

### *15. Third Party Outpatient Collection System (TPOCS)*

TPOCS provides data collection, tracking and reporting for outpatient billing processes. The system creates more than 3.5 million clinic, laboratory, radiology and pharmacy claims each year. TPOCS maintains automated interfaces that improve data quality by reducing manual entry and providing automated data validation.

### *16. TRICARE Encounter Data (TED) System*

MHS supplements its direct care network through a global network of civilian health professionals, hospitals, pharmacies and suppliers. These purchased care providers submit claims to insurance carriers, seeking payment for services rendered. Carriers then electronically transmit claims payment information to MHS using TED, the global MHS industry leader in purchased care claims data records processing. In FY 2009, MHS processed more than 184 million TED records, representing almost \$20 billion in healthcare—up five percent from 2008. MHS also reduced TED's daily time for processing about 700,000 records from five to three hours—a 40 percent improvement. The time for auditing TED's cycles also dropped from days to hours, and system automation simplified data transfers from TED to MDR.

TED receives, validates, edits, processes, aggregates and integrates all data. TED records are processed against MHS business rules to ensure data completeness and accuracy. MHS then authorizes electronic payment of validated claims, usually within 24 hours following receipt of TED records. The result is shorter billing cycles and reimbursements paid within 30 days, one of the fastest claims processing cycles in the healthcare industry. Quick, easy payment of claims tends to encourage purchased care providers to accept MHS beneficiaries as patients.

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### VI. MHS HIT PARTNERSHIP AND OUTREACH ACTIVITIES

MHS continues to promote the use and benefits of medical informatics. MHS participates in conferences and product demonstrations, and makes routine, concrete efforts to communicate with its stakeholders through traditional media, including Web sites, brochures, internal newsletters and external news outlets. MHS also uses social media outlets to distribute information about HIT and informatics to stakeholders. The new media offerings seek to deliver information in locations where stakeholders spend time online. These efforts support the goal of sharing electronic health information, as MHS and its federal, state and private sector healthcare counterparts share lessons learned, explore potential partnerships, and participate in interagency initiatives. A representative sample of efforts and events follows.

#### A. Conferences and Demonstrations

In FY 2009, MHS personnel participated in conferences and demonstrations, including the following (listed chronologically):

**Association of Military Surgeons of the United States Annual Conference**, San Antonio, Texas, November 9-14, 2008. MHS demonstrated AHLTA, CDM, CCQAS, DCAM, DMLSS, Essentris and EWS-R.

**Perspectives on Employment of People with Disabilities 27<sup>th</sup> Annual Conference**, Bethesda, Maryland, December 10-12, 2008. Co-sponsored by eight federal agencies and chaired by the Office of Disability Employment Policy, this annual conference and training event addresses issues affecting people with disabilities who are employed by the federal government. The Director of the MHS Computer/Electronic Accommodations Program (CAP) presented CAP's assistive technology, joined by the Assistant Secretary, Office of Disability Employment Policy, Department of Labor; Commissioner of Equal Employment Opportunity Commission; and Secretary of VA.

**California State University Northridge International Technology & Persons with Disabilities Conference**, Los Angeles, California, March 16-21, 2009. The Director of CAP spoke at the Conference, which offers an inclusive setting for researchers, practitioners, exhibitors, end users, speakers and others to share knowledge and best practices in the field of assistive technology; and highlights innovations and practical solutions that remove barriers to full participation of persons with disabilities in educational, workplace and social settings.

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**Navy and Marine Corps 2009 Public Health Conference**, Hampton, Virginia, March 23-24, 2009. MHS featured CDM, DOEHRS-C, DOEHRS-IH and *MHS Insight*.

**Healthcare Information and Management Systems Society (HIMSS) Annual Conference and Exhibition**, Chicago, Illinois, April 4-8, 2009.

HIMSS is the healthcare industry's membership organization focused exclusively on providing global leadership for the optimal use of HIT and management systems for the improvement of healthcare delivery. HIMSS frames and leads healthcare public policy and industry practices through its legislative advocacy, knowledge sharing, collaboration and community affiliations. MHS works with HIMSS year round on efforts to advance the President's Executive Orders and the goal of interoperable EHRs for most Americans within a decade.

HIMSS09 welcomed almost 900 exhibitors and 27,500 attendees to explore and interact with EHR applications and other HIT solutions. MHS leaders demonstrated HIT products, including leading-edge technologies, capabilities and initiatives that support a worldwide network of military hospitals, military health clinics and DoD civilian partners. MHS leaders also led educational sessions, including:

- *The DoD EHR: Mapping the "Way Ahead" for AHLTA*
- *Medical Logistics Supporting the Warfighter: Evolution to a Net-Centric Environment* (HIT Infrastructure and Architecture)
- *Health Information Management from the Battlefield to the Home Front* (Enterprise Information Systems)
- *Integrating Medical and Dental Charting with the DoD EHR*
- *Support. Equip. Empower.* (Enabling Technology)
- *Clinical Data-Mining Quickly Identifies Patient Risks Worldwide* (Population Health and Public Health)

**The Power of *MHS Insight***, April 14, 2009. DHSS demonstrated *MHS Insight* to the Chief of IM/IT for Health Policy Analysis & Evaluation (HPA&E) and the Office of the Chief Medical Officer.

**National Patient Safety Foundation Conference**, Washington, DC, May 21-22, 2009. MHS exhibited CCQAS and PSR.

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**American Industrial Hygiene Conference and Exhibition**, Toronto, Canada, May 30-June 4, 2009. MHS exhibited DOEHRS-IH.

**The Power of VA-DoD Sharing**, St. Petersburg Beach, Florida, June 2-4, 2009. MHS Office of the Chief Information Officer (OCIO) participated in discussions of opportunities and responsibilities associated with direct resource sharing agreements and VA's participation in TRICARE Managed Care Support Networks. Approximately 500 participants discussed best practices derived from DoD/VA Joint Incentive Fund projects, joint ventures and other innovative sharing agreements, federal policy developments, improving billing practices, PRC/MTF referral, and other topics germane to VA/DoD Sharing.

**Association of the United States Army 2009 Medical Symposium and Exhibition**, San Antonio, Texas, July 23, 2009. MHS exhibited CDM, DCAM, DMHRSi, DMLSS, *MHS Insight*, *MHS Learn* and PMITS.

**American Society for Healthcare Engineering Conference**, Anaheim, California, August 2-5, 2009. MHS exhibited DMLSS.

**Force Health Protection Conference**, Albuquerque, New Mexico, August 18-19, 2009. MHS exhibited CDM, DCAM, DOEHRS-IH, DOEHRS-HC, DMLSS, ESSENCE and PMITS.

### **B. Traditional Media**

#### **1. Brochures**

To educate and inform the public about MHS HIT and informatics, OCIO publishes brochures describing its program offices, and highlighting initiatives and accomplishments. Brochures for CAP, DHSS, Defense Health Information Medical Systems (DHIMS), and Tri-Service Infrastructure Management Program Office (TIMPO) are posted online ([www.health.mil/mhscio](http://www.health.mil/mhscio)).

#### **2. Mass Market**

To educate and inform the public about developments in MHS HIT and informatics, OCIO personnel grant interviews and submit articles to external publications throughout the year. A chronological selection of articles follows.

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**US Marine Corps Forces Europe**, September 2008, discusses challenges and successes of linking the Marine Corps Prepositioning Program—Norway to DMLSS.

**Government Health IT News**, November 2008  
([www.govhealthit.com/newsitem.aspx?tid=88&nid=69615](http://www.govhealthit.com/newsitem.aspx?tid=88&nid=69615)) features *MHS Insight*.

**US Medicine**, March 2009 ([www.usmedicine.com/articles/tricare-offering-online-ptsdtbi-education-for-civilian-physicians.html](http://www.usmedicine.com/articles/tricare-offering-online-ptsdtbi-education-for-civilian-physicians.html)) features *MHS Learn's* Civilian Provider Portal for PTSD/TBI Education.

**American Heart Association Journal**, March 2009  
(<http://circoutcomes.ahajournals.org/cgi/content/full/2/2/108?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=s.+ward&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT>). MDR data cited in *Use of Oseltamivir After Influenza Infection Is Associated With Reduced Incidence of Recurrent Adverse Cardiovascular Outcomes Among Military Health System Beneficiaries With Prior Cardiovascular Diseases*, by S. Ward Casscells, et al.

**Military Medical/CBRN Technology**, *CIO Report: Computer/Electronic Accommodations Program*, April/May 2009 ([www.military-information-technology.com/mmt-home/115-mmt-2009-volume-13-issue-2/1055-cio-report.html](http://www.military-information-technology.com/mmt-home/115-mmt-2009-volume-13-issue-2/1055-cio-report.html)).

**Military Medical/CBRN Technology**, April/May 2009 ([www.military-information-technology.com/mmt-home/115-mmt-2009-volume-13-issue-2/1052-directorate-of-medical-materiel.html](http://www.military-information-technology.com/mmt-home/115-mmt-2009-volume-13-issue-2/1052-directorate-of-medical-materiel.html)). Director of the Medical Operations Directorate, Defense Supply Center Philadelphia, describes operations of the DoD Executive Agent for Medical Materiel, the DLA Medical Directorate that provides \$4.2 billion annually in medical materiel and services.

**Military Medical/CBRN Technology**, *CIO Report: Virtual Lifetime Electronic Record Moves Closer*, June 2009 ([www.military-information-technology.com/mmt-home/179-mmt-2009-volume-13-issue-3/1663-cio-report.html](http://www.military-information-technology.com/mmt-home/179-mmt-2009-volume-13-issue-3/1663-cio-report.html)).

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**Military Medical/CBRN Technology**, *CIO Report: AHLTA Goes Dental*, July 2009 ([www.military-information-technology.com/mmt-home/187-mmt-2009-volume-13-issue-4/1742-cio-report.html](http://www.military-information-technology.com/mmt-home/187-mmt-2009-volume-13-issue-4/1742-cio-report.html)).

**Government Health IT**, July/August 2009 ([http://govhealthit.com/docs/magazine/GHIT\\_v4n4\\_final\\_cover.pdf](http://govhealthit.com/docs/magazine/GHIT_v4n4_final_cover.pdf)) discusses Medical Situational Awareness in Theater, a portal application that will provide a graphical view of potential health threats to troops and support decision making on the location of military medical units.

**National Defense Magazine**, August 2009 ([www.nationaldefensemagazine.org/archive/2009/August/Pages/PrognosisIsNotGoodforMilitary%E2%80%99sMedicalRecordsSystem.aspx](http://www.nationaldefensemagazine.org/archive/2009/August/Pages/PrognosisIsNotGoodforMilitary%E2%80%99sMedicalRecordsSystem.aspx)) includes an interview of MHS's Chief Medical Officer concerning AHLTA's way forward.

### 3. *Newsletters*

To educate and inform DoD staff and contractors, OCIO publishes internal newsletters covering current HIT initiatives and accomplishments. OCIO's newsletter, *MORE*, is delivered electronically to MHS stakeholders; program office newsletters are posted online.

### 4. *Web Sites*

Web sites are another outlet for current news about MHS HIT and informatics.

#### a. *DHIMS*

DHIMS has a Web presence (<http://dhims.health.mil>) for informative and educational resources related to the DHIMS program office, program operations, and current product lines.

#### b. *MHS OCIO*

MHS OCIO maintains a Web site, *Single Source* (<http://health.mil/mhscio/default.htm>), as a portal to enterprise guidance and information. *Single Source* exemplifies OCIO's commitment to enterprise effectiveness and efficiency through information sharing excellence.



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### *c. MiCare*

*MiCare* (<https://www.micare.va.gov/Portal/Index.aspx>) is a DoD-sponsored prototype Web site that facilitates the transfer of MHS beneficiaries' personal EHR to a PHR. The Web site recently received approval to expand beyond its current pilot program. Through *MiCare*, an MHS beneficiary may designate either Microsoft HealthVault™ or Google™ Health as the PHR to receive and store medical information. Upon authorization, MHS will transmit 24 months of medical history to the PHR, including laboratory reports, radiology reports, allergy information, conditions, procedures, in-patient and out-patient notes, and medications.

### *d. TRICARE Online (TOL)*

TOL (<https://www.tricareonline.com/welcome.do>) is an online portal for healthcare services, benefits and health information for MHS. TOL users can schedule medical appointments, order prescription refills, view PHRs and access vital MHS health information, anytime and anywhere. (Further discussion of TOL appears above at page 32.)

## **C. Emerging Media**

The MHS OCIO uses social media outlets to distribute information about HIT and informatics to stakeholders. The new media offerings seek to deliver OCIO information at locations where its customers are spending time online. Blogs, *Delicious*, *Facebook*, *Twitter* and *YouTube* are integrated into the OCIO outreach strategy to reach an audience of employees, policy professionals, lawmakers and researchers.

### **1. Blogs**

The MHS blog (<http://health.mil/MHSBlog>) allows OCIO leaders to publish entries linked to the MHS's health.mil Web site. With a variety of contributing writers from across MHS, the blog maintains a broad audience of readers interested in military health issues. Articles from OCIO have covered topics such as Laureate recognition from the *Computerworld* Honors Program and the launch of the DHIMS Web site.

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### 2. *Delicious*

Links to articles and Web pages of interest to MHS OCIO are bookmarked on the URL sharing site, *Delicious* (<http://delicious.com/militaryhealth>; <http://delicious.com/mhsocio>). News articles, blogs and homepages are indexed for review on the MHS OCIO page. These pages are tagged with searchable keywords to allow site visitors to find relevant material within the links. Saved pages include *Electronic Health Records: A Checkup*, CNNMoney.com; *Obama announces new Veterans' medical records system*, CNNPolitics.com; and *Single Web site key for Vets' combined medical, benefits record*, Nextgov.com.

### 3. *Facebook*

Information with appeal to the larger MHS community, such as the launch of the new DHIMS Web site, is publicized through *Facebook* ([www.facebook.com/healthdotmil](http://www.facebook.com/healthdotmil)). *Facebook* links registered fans to messages, updates, photos, videos and links posted by MHS. As of September 30, 2009, the number of registered fans was near 400.

### 4. *Twitter*

MHS OCIO sends short electronic messages to its registered followers on *Twitter* (<http://twitter.com/MHSOCIO>). Messages address topics such as the number of MTFs to deploy AHLTA 3.3; approval of the expansion of the MiCare PHR pilot at Madigan Army Medical Center; and recognition of the one-year anniversary of DHIMS and DHSS. As of September 30, 2009, the number of people following MHS OCIO on *Twitter* was near 300.

### 5. *YouTube*

MHS OCIO maintains a playlist on *YouTube* ([www.youtube.com/militaryhealth](http://www.youtube.com/militaryhealth)), a video file sharing Web site. Videos feature interviews with OCIO personnel. Past topics include medical logistics in a net-centric environment supporting the warfighter; the way ahead for AHLTA; and digital dental records replacing paper records in dental clinics.

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## SUMMARY

With the joint leadership of DoD and VA, the Departments continue to develop and implement numerous interagency medical informatics initiatives and today are delivering HIT solutions that significantly improve the secure sharing of appropriate electronic health information for our shared beneficiaries and the seamless transition for Service members to Veteran status.

Beyond the DoD/VA partnership, DoD engaged in strategic relationships in both the public and private sectors to advance healthcare informatics and promote and define standards for system interoperability.

DoD is working to improve coordination and collaboration on national HIT solutions and is striving to advance the goal of the President's Executive Orders to establish an interoperable health record for most Americans by 2014 and promote quality and efficient healthcare operations. DoD is committed to continued collaboration and the appropriate sharing of health information as systems and data repositories mature and standards and processes are further defined and implemented.

DoD is expanding its use of medical informatics through MHS decision support systems. Expanded use will help improve beneficiaries' healthcare by implementing medical surveillance, supporting quality improvement, and fostering clinical and business best practices.

Through outreach activities with other federal agencies, industry partners, professional organizations and others, DoD shares advances and lessons learned in medical informatics and HIT. In concert with government and industry associates, DoD will continue to improve and leverage its informatics knowledge to enhance MHS medical capabilities and support the global system that sustains the health of all MHS beneficiaries.

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## ACRONYMS

AFB	Air Force Base
AHLTA-T	AHLTA-Theater
ARRA	American Recovery and Reinvestment Act of 2009
B2B	Business-to-Business
BEC	VA/DoD Benefits Executive Council
BPFM	MCFAS Beneficiary Population Forecasting Model
CAPRI	Compensation and Pension Record Interchange
CCHIT	Certification Commission for Healthcare Information Technology
CDC	Centers for Disease Control and Prevention
CDR	Clinical Data Repository
CHDR	Clinical Data Repository/Health Data Repository
COTS	Commercial Off-the-Shelf
CT	Computerized Tomography
DBSS	Defense Blood Standard System
DCS	Duplicate Claims System
DFAS	Defense Finance and Accounting Service

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DHSS	Defense Health Services Systems
DMHRSi	Defense Medical Human Resource System
DoD	Department of Defense
DOEHRS-IH	Defense Occupational and Environmental Health Readiness System—Industrial Hygiene
EAS	Expense Assignment System
ESSENCE	Electronic Surveillance System for Early Notification of Community-Based Epidemics
EWS-R	Enterprise Wide Scheduling and Registration System
FDA	Food and Drug Administration
FHIE	Federal Health Information Exchange
HAIMS	Healthcare Artifact and Image Management Solution
HEC	VA/DoD Health Executive Council
HIE	Health information exchange
HIN	Health information network
HIT	Health Information Technology
HL7	Health Level Seven, Inc.

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IDEA	Individuals with Disabilities Education Act of 2004
IPO	Interagency Program Office
JEC	VA/DoD Joint Executive Council
JSP	VA/DoD JEC Joint Strategic Plan
LOA	Line of Action
M2	MHS Management Analysis and Reporting Tool
MCS	TRICARE Managed Care Support
MHS	Military Health System
MTF	Military Treatment Facility
NDAA	National Defense Authorization Act
NHIN-C	Nationwide Health Information Network Consortium
NNMC	National Naval Medical Center
OCMO	Office of Chief Medical Officer
OMB	Office of Management and Budget
PACS	Picture Archive Communication System
PCDW	Purchased Care Data Warehouse
PDHRA	Post-Deployment Health Reassessment

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PHI	Protected Health Information
PHR	Personal Health Record
PMITS	Patient Movement Items Tracking System
PPS	Prospective Payment System
PSR	Patient Safety Reporting
RFID	Radio Frequency Identification
SDO	Standards Development Organization
SNPMIS	Special Needs Program Management Information System
SOC	Senior Oversight Committee
TED	TRICARE Encounter Data
TOL	TRICARE Online
US	Ultra Sound
VHA	Veterans Health Administration
VLER	Virtual Lifetime Electronic Record
WRAMC	Walter Reed Army Medical Center