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INTRODUCTION

Chairman Shelby, Ranking Member Durbin, and distinguished members of the Subcommittee, thank you for the opportunity to testify before you today. I am honored to represent the Department of Defense (DoD) as the former program executive officer responsible for modernizing the military's electronic health record (EHR) system and enhancing interoperability and data sharing with the Department of Veterans Affairs (VA) and private sector providers.

The mission of the Program Executive Office, Defense Healthcare Management Systems (PEO DHMS) is to transform the delivery of healthcare and advance data sharing through a modernized EHR for service members, veterans, and their families. To this end, the DoD is committed to three equally important objectives: deploy a single, integrated inpatient and outpatient EHR, branded MHS GENESIS; improve data sharing with the VA and our private sector healthcare partners; and successfully transform the delivery of healthcare in the Military Health System (MHS) through advanced tools that provide beneficiaries more control over their healthcare experience. In June 2017, former VA Secretary Shulkin announced his decision to adopt the same EHR as the DoD. Since both departments will use the same commercial software solution, interoperability is no longer an issue. The DoD and VA will deploy one single instance. For the first time ever, medical data from the DoD and VA will be stored in a single database, reducing the burden for our service members and veterans, placing them in the center of their healthcare.

Our mission aligns with the DoD's National Defense Strategy (NDS) to modernize the DoD and provide combat-credible military forces. The threats facing our nation constantly evolve and a medically ready military force is critical to our national defense. MHS GENESIS advances that mission. This cutting edge technology will supply MHS providers with the necessary data to collaborate and make the best possible healthcare decisions for our service members to remain mission ready and mission focused, contributing to the NDS strategic approach to restore warfighting readiness and field a lethal force.

HISTORY

Requirement from Congress

The DoD was an early pioneer in the development of a centralized, global EHR when it introduced AHLTA in 2004. At the time, the private sector viewed the DoD's in-house EHR solution as the future of healthcare documentation. However, the DoD's health information technology (IT) systems are dated, are not integrated, and are not seamlessly interoperable with the VA. In the Fiscal Year 2008 National Defense Authorization Act, Congress directed the Secretaries of the DoD and VA to develop and implement EHR systems or capabilities that provide full interoperability of personal health care information between the DoD and VA. Additionally, it directed the establishment of an interagency program office for the DoD and VA.

The DoD/VA Interagency Program Office (IPO) was established to lead EHR efforts between the DoD and VA to improve the quality of healthcare, improve clinical and patient experiences, and increase interoperability among the Departments and the private sector. From 2010 to 2013, the DoD and VA executed a joint program called the integrated Electronic Health Record (iEHR) with the goal to create a single next-generation EHR system, led by the DoD/VA IPO.

The iEHR allowed the DoD and VA to improve interoperability through a series of focused data sharing initiatives, including the deployment of the Joint Legacy Viewer (JLV), which provides an integrated view of VA and DoD clinical information. JLV allows the DoD to leverage our expanding relationships with private-sector providers, providing clinicians a real-time comprehensive, single view of a patient's health history whether they receive care in a military or commercial facility. JLV is available to DoD providers in AHLTA as well as MHS GENESIS, and statistics indicate more than one million patient records each month are viewed between the DoD and VA combined.

Although the iEHR didn't progress beyond the first joint venture site, it was an important learning opportunity for the DoD and the VA. The Departments fully recognized that medical data interoperability requires a steadfast commitment and continuous improvement. Ultimately, it was the lack of standardization between the Departments' policies that inhibited the ability of

the DoD and VA to implement the technologies available at the time and define long-term success.

Capitalizing on the lessons learned, the DoD transitioned from multiple EHR systems to a single, integrated commercial-off-the-shelf (COTS) capability. The DoD determined the MHS requirements could be better met by a state-of-the-market commercial application that would allow the DoD to leverage private sector investments in technology and establish data sharing networks with civilian partners to reduce costs and improve the customer experience. Staying current with the latest advancements in technology without being the only investment stream enables the DoD to benefit from some of the best products in health IT without solely carrying the financial burden.

Throughout this process, the DoD/VA IPO continues to be jointly staffed and jointly funded with collaborative DoD and VA leadership and management. As the Departments' EHR missions evolved, the IPO was re-chartered in December 2013 to lead the Departments' efforts to implement national health data standards and establish technical standards to increase health data interoperability.

2015 Contract
In July 2015, the DoD competitively awarded a contract to the Leidos Partnership for Defense Health (LPDH) to deliver a modern, interoperable EHR. The LPDH team consists of four core partners: Leidos Inc., as the prime developer, and three primary partners in Cerner Corporation, Accenture, and Henry Schein Inc. This modern, secure, connected EHR, MHS GENESIS, provides a state of the market COTS solution consisting of Cerner Millennium, an industry-leading EHR, and Henry Schein's Dentrix Enterprise, a best of breed dental module.

The deployment and implementation of MHS GENESIS across the MHS is a team effort. Complex business transformation requires constant coordination and communication with stakeholders and partners, including the medical and technical community, to ensure functionality, usability, and data security. The DoD engaged stakeholders across the MHS to identify requirements and standard workflows. The result was a collaborative effort across the

Services and the Defense Health Agency (DHA) to ensure the clinical workflows enabled by MHS GENESIS are standard and consistent across the enterprise to minimize variation in the delivery of healthcare.

Through a tailored acquisition approach, the DoD leveraged commercial best practices and its own independent test community to field a modern, secure, and connected system that provides the best possible solution from day one. While there is still much work to do, the integration of the commercial data hosting into DoD networks and systems represents a new direction in Pentagon IT culture and practice. This innovative approach set the bar for COTS systems and commercial partnerships with the DoD and other federal agencies in the future.

Pilot Sites

We employ industry standards to optimize the delivery of MHS GENESIS. Rollout across the MHS follows a "wave" model. Pilot sites in the Pacific Northwest were the first wave of military treatment facilities (MTFs) to receive MHS GENESIS, which began February 2017 at Fairchild Air Force Base (AFB) just 19 months after contract award, and officially concluded in January 2018 at Madigan Army Medical Center (MAMC). The DoD's deployment to four pilot sites spanned a cross section of size and complexity. The lessons learned from the DoD pilot sites will make worldwide deployment of MHS GENESIS to the DoD, the United States Coast Guard (USCG) and the VA successful. As of today, those four pilot sites continue to use MHS GENESIS to safely deliver, manage, and document healthcare – completing over 100,000 patient encounters each month.

Deployment of MHS GENESIS will occur by region—three in the continental U.S. and two overseas—in a total of 23 waves. Each wave will include an average of three hospitals and 15 physical locations and will last approximately one year. Regionally grouped waves, such as the Pacific Northwest, will run concurrently. This approach allows the DoD to take full advantage of lessons learned and experience gained from prior waves to maximize efficiencies in subsequent waves, increasing the potential to reduce the deployment schedule in areas where necessary. Full Operational Capability (FOC), to include garrison medical and dental facilities worldwide, is scheduled for 2023.

Expanding Federal Partnerships

Last year, the USCG joined the DoD's EHR implementation and the VA entered into a contract to implement the same EHR as the DoD. The result of these decisions will be a single, integrated EHR for all service members, veterans, and their families. The deployment of a single integrated EHR for the DoD, VA, and the USCG will enable more efficient, highly reliable, safe, and quality care. This solution will focus on clinical services, interfaces, and a shared infrastructure to enable shared workflows, user roles, order sets, training, and cybersecurity standards. The health and safety of our most important asset—our people—is our highest priority. I recently spoke with the Commanding Officer at one of our pilot sites and he said:

"Despite the challenges of rolling out a new electronic health record, the new EHR is much more integrated and capable than our legacy systems. Features such as bar code scanning of inpatient and Labor & Delivery medications and blood transfusions, as well as enhanced medication reconciliation and Patient Portal features are a few of the features that are bringing our EHR into the 21st century. We are only beginning to scratch the surface of what MHS GENESIS can do for our patients to enhance safety and continuity of care across the enterprise. We are excited about future interoperability and to ultimately have the DoD and VA on the same electronic health record platform. The future is bright."

Partnering with the VA and USCG fundamentally eliminates the need to exchange data while ensuring interoperability with private healthcare providers and continuity of care for all of our service members. A single, integrated EHR for the DoD, USCG, and VA for the first time provides the transitioning service member with the complete longitudinal record in one place at the time of need to support healthcare delivery and benefits adjudication seamlessly and without the need to move data from one system to another. This patent-centered approach allows us to drive national interoperability and data standards to benefit service members, veterans, and all Americans.

LESSONS LEARNED

Change Management

Leadership from the DoD is heavily engaged and invested in the success of MHS GENESIS, and we continually take lessons learned from training, adoption of workflows, and change management activities.

Following deployment to the pilot sites, PEO DHMS implemented an eight week stabilization and adoption period in January of 2018. During this time, we optimized MHS GENESIS to establish a baseline configuration, focusing on training, adoption of workflows, and change management activities. The DoD identified several lessons learned regarding training. MHS GENESIS training focused on "buttonology" rather than a workflow approach. The DoD is resolving the training approach through three fundamental changes to the MHS GENESIS training strategy. First, workflow adoption in key areas is being trained in advance of MHS GENESIS deployment and being led by the functional community. Second, training is being reconfigured to focus on role-based workflow training that teaches the user how to perform key tasks using MHS GENESIS. Third, the MHS will utilize a peer expert program, a proven commercial best practice that utilizes an updated training environment to deliver team based training and just in time training during and after Go-Live. Our pilot deployments also provided lessons learned for future training by reducing redundant training content for users with multiple roles, transitioning from the aforementioned "buttonology" based training to a scenario and workflow based approach, and ensuring the training technical environment is in sync with the production environment.

Operational testing and user feedback

The DoD values the feedback from end users, stakeholders, and the test community. In December 2018, DoD leadership evaluated the cost, performance, and schedule of the MHS GENESIS program and made the decision to approve continued deployment. Among the many factors that informed this decision is the Initial Operational Test & Evaluation (IOT&E) report. Approximately 90 percent of the total Incident Reports (IR) captured at our pilot sites fall into workflow and configuration, end user knowledge of the system, policy issues, or recommendations for future enhancements. The remaining 10 percent of the total IRs can be traced to a defect in the software solution that makes up MHS GENESIS. Since the IOT&E

report, the DoD continues to progress with responding to user feedback; 100 percent of the defect IRs that the functional community categorized as high priority have been resolved and recommended for closure. The DoD notes the report recommends we "conduct Follow-on Operational Testing & Evaluation at the next fielding to evaluate corrective actions and revised training, to inform future fielding decisions." The DoD concurs with this recommendation and believes follow-on testing will validate the improvements made to enterprise work processes, the system solution, and training that impacts end users at our next facilities.

Federal Electronic Health Record Modernization Working Group
On September 28, 2018, the Secretaries of Defense and Veterans Affairs signed a Joint Commitment Statement pledging to align VA and DoD strategies to implement an interoperable EHR system. In response to this commitment, the DoD and VA evaluated program dependencies such as infrastructure, incorporation of clinical and business processes, and other requirements from the functional, technical, and programmatic communities. DoD and VA leadership determined the optimal and lowest risk alternative is to re-charter the DoD/VA IPO into the Federal Electronic Health Record Modernization (FEHRM) Program Office. The FEHRM, which will incorporate key members of the IPO as well as DoD and VA program office staff, will provide a more comprehensive, agile, and coordinated management authority to execute requirements necessary for a single, seamless integrated EHR.

Leadership Commitment is Critical to Success
Change is always hard. This is especially true when deploying a single, integrated inpatient and outpatient EHR, while standardizing enterprise wide workflows across more than 400 military treatment facilities. Research in 2017 from KLAS identifies leadership engagement, education, and good governance as factors that contribute to the success of an EHR implementation. A recent study shows the JPS Health Network ranks in the 99th percentile for provider job fulfillment. This team credits their success to executive leadership, specifically highlighting that "senior executives lead by example and expect all clinicians and employees to demonstrate service to others." The DoD leadership agrees and is heavily engaged and invested in the success of MHS GENESIS. We continually take lessons learned from training, adoption of workflows, and change management activities.

PROGRESS

Patient Safety and Cyber Focus
We work closely with the MHS community to continuously refine and enhance the system to meet the needs of the military health community based on ongoing, real-time feedback from the testing sites. Patient safety and protecting beneficiaries' personal health data are the two highest priorities for the MHS and those priorities guide the implementation of MHS GENESIS.

Since the inception of the MHS GENESIS program, PEO DHMS has worked closely with the DoD Chief Information Officer (CIO), the DHA CIO, and the MHS GENESIS vendor team to secure beneficiary data by leveraging commercial and DoD best practices, including architecture, tools, and processes. A commercial datacenter hosts MHS GENESIS. It is both physically and virtually segregated within the datacenter and undergoes continuous scanning to identify and mitigate risks. Further, DoD experts monitor and defend it to meet DoD cybersecurity standards, and as a result, DoD mitigated nearly 90 percent of all identified risk to moderate, low, or very low.

The DoD strives to maintain the most advanced information assurance (IA) capabilities in the world. To leverage these capabilities, DoD IA tools and personnel are embedded within the datacenter boundary to ensure the data MHS GENESIS exchanges is monitored, protected, and defended from cyberattacks. The DoD also established continuous cyber assessments as a service, leveraging DoD's formal Cooperative Vulnerability and Penetration Assessment and Adversarial Assessment processes to improve the overall cyber posture of MHS GENESIS. This innovative approach to public/private partnering not only improves the cyber posture for the DoD but also the vendor's commercial customers and the healthcare industry in general.

MHS GENESIS incorporates several IA improvements over the legacy systems it replaces, including mandatory use of the Common Access Card and Public Key Infrastructure, a single instance of software architected to replace hundreds of distributed legacy instances, and secure implementation of medical devices. On November 29, 2018, the DoD CIO, who serves as the

Authorizing Official for MHS GENESIS, renewed the program's Authority to Operate with Conditions for 12 months.

Metrics, Global Trigger Tool, & Patient Safety Enhancements
Cyber security and patient safety remain our top priorities, and we are committed to getting the deployment of MHS GENESIS right to ensure the delivery of safe, quality care to service members, veterans, and their families.

Many improvements in the adoption of MHS GENESIS were seen in 2018 that led to more effective care. For example, there was a 45 percent increase in referrals processed in one business day; a 38 percent decrease in the time nurses spent in the EHR in outpatient care settings; a 26 percent decrease in the total time providers spent in the EHR for ambulatory clinics; a 16 percent increase in operating room procedure volume; a 21 percent decrease in the provider order time per patient at all pilot sites; and 2,300 duplicate lab orders avoided.

Patient care and medication safety improvements are being implemented in MHS GENESIS. Since 2018, the pilot sites realized the following achievements: a 32 percent increase with the number of patients seen in outpatient care settings; an 8.1 percent improvement in turnaround time for STAT chemistry lab tests; an 88.5 percent average in discharge medication reconciliation compliance; an 84 percent average Bar Code Medication Administration compliance; and a 63 percent increase in new prescriptions and refills.

With any EHR deployment, there is potential for increased error. This is expected and seen in commercial marketplace deployments. The DoD carefully monitored patient safety throughout the deployment through its Joint Patient Safety Reporting System (JPSRS), as well as with the Global Trigger Tool (GTT). Both the JPSRS and the GTT are recognized safety monitoring processes and tools used throughout the healthcare industry. We continue to use the GTT, which was developed by the Institute for Healthcare Improvement to leverage chart review by trained clinical abstractors of "triggers" or indicators of adverse events. Once a trigger is identified, the record is examined more closely for evidence of harm. While it is measured as a rate, GTT data can also be used as a baseline for ongoing safety monitoring during deployment of MHS GENESIS.

Comparing the data from our pilot sites to other military treatment facilities using legacy systems, there was no increase in patient safety harm events prior to and following the deployment of MHS GENESIS at the pilot sites.

Service to Enterprise Transition

Lessons learned from the pilot site fielding indicate that enterprise level management is a more effective way to field MHS GENESIS. Standard workflows and processes continue to prove beneficial to system implementation and end user adoption. As the DoD implements Congressional direction to transition from service unique to enterprise-managed healthcare, MHS GENESIS will enable further standardization and drive increased efficiency across the enterprise.

Waves 1-6 Status & Defense Acquisition Board Update

MHS GENESIS completed deployment to our pilot sites, applied lessons learned and feedback from users and the test community, and is on track for full deployment by the end of calendar year 2023. Our deployment to four pilot sites in 2017 enabled the DoD to gather feedback in order to further configure MHS GENESIS for future wave deployments. PEO DHMS received exciting news in December 2018 when participating in the DoD EHR Defense Acquisition Board assessment of the DoD Healthcare Management System Modernization Program Management Office's readiness for a Limited Fielding Decision. The Assistant Secretary of Defense for Acquisition affirmed MHS GENESIS met the criteria for approved deployment to Waves 1-6 fielding sites, which is in line with the full deployment schedule. The next deployment Wave includes: Travis Air Force Base, Naval Health Clinic Lemoore, Presidio of Monterey, Mountain Home Air Force Base, and surrounding clinics.

CONCLUSION

Thank you again for the opportunity to come here today and share the progress we've made to transform the delivery of healthcare for service members, veterans, and their families. The successful deployment of MHS GENESIS to our four pilot sites was an important milestone in implementing what will be the largest integrated inpatient and outpatient EHR in the United

States. Because of its tremendous impact not only on military healthcare, but on healthcare across the United States, I personally traveled to the Pacific Northwest on 12 separate occasions ahead of and during the rollout to our pilot sites. I engaged with the leadership as well as system users to gain a better understanding of the overall impact on providers. While we experienced some challenges, we continue to progress, and providers as well as the DoD are seeing the benefit. I recently received a quote from a provider:

 "*Modernization of the DoD Electronic Health Record was a necessity. MHS GENESIS became our opportunity. It shined a light onto the Military Health System, illuminating the best practices throughout the MHS and identifying areas needing improvement. It caused us to breakdown not only the barriers between services and the barriers between the DoD and the VA, but also the barriers between all specialists within a hospital's or clinic's care continuum. Never before have I seen nurses, physicians, surgeons, and transfusion technicians sit side-by-side and collaborate as intensely as I witness daily with MHS GENESIS. Every day, multi-disciplinary teams work across the pilot sites and the country to bring timely, relevant, evidenced-based practice to MHS GENESIS. This is more than an Electronic Health Record; it is a collaborative health record serving our nation's service members, veterans, and their families. There is much work to be done to deploy and optimize MHS GENESIS, but it is a great leap forward in support of the healthcare of this deserving population*".

In closing, I welcome PEO DHMS' new program executive officer, Mr. William J. Tinston. Mr. Tinston joins us from the Defense Logistics Agency (DLA), where he served as Program Executive Officer. In this role, he was responsible for the management and oversight of DLA's Major Automated Information Systems programs and special interest programs. His strong acquisition, business systems, and executive experience will provide superior leadership as we continue to deploy relevant health IT solutions to the DoD along with our federal partners. Mr. Tinston is fully engaged with the progress of the FEHRM Working Group and will work with this team to re-charter the IPO, integrate acquisition management, and coordinate the EHR deployment in support of the DoD, USCG, and VA. We began official turnover March 11, and I transitioned to my new position in the Office of the Assistant Secretary of Defense for Acquisition on March 25.

While we are well on our way, PEO DHMS continues to progress as an organization striving for nothing less than outstanding results and acquisition excellence. We are agile and iterative in our approach and are committed to identifying the right capabilities and delivering them to our customers. As a partner in our progress, we appreciate Congress' interest and ask for your continued support to help us deliver on our promise to provide world-class care and services to those who faithfully serve our nation. Again, thank you for this opportunity, and I look forward to your questions.