



February 2022

ELECTRONIC HEALTH RECORDS

VA Needs to Address Data Management Challenges for New System

Why GAO Did This Study

VA clinicians use health data to provide health care services to the nation's veterans. Stakeholders across the department also rely on health data to support reporting capabilities that can help monitor patient safety and measure the quality of care, among other things.

GAO was asked to review VA's EHRM data management plans. The objectives of this review included describing the department's plans for (1) migrating data to the new EHR system and determining the extent to which VA has implemented its plans and (2) continuity of reporting and determining the extent to which the department has implemented its plans.

To do so, GAO reviewed VA's plans and progress reports discussing data migration and reporting continuity for EHRM. GAO also compared these efforts to applicable federal guidance for data management and relevant project management practices. In addition, GAO interviewed knowledgeable VA officials.

What GAO Recommends

GAO is making two recommendations to VA that it (1) establish and use performance measures and goals to ensure the quality of migrated data and (2) use a stakeholder register to identify and engage all relevant EHRM stakeholders to meet their reporting needs. VA concurred with GAO's recommendations.

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VA Needs to Address Data Management Challenges for New System

What GAO Found

The Department of Veterans Affairs (VA) relies on health data in its electronic health record (EHR) system and Corporate Data Warehouse to support its mission. VA has undertaken an effort to replace its legacy EHR system with a commercial system developed by Cerner Government Services, Inc. (Cerner). As shown in the figure, health data management activities planned for the department's EHR modernization (EHRM) include the following:

- Migrating data from the legacy EHR system to the new system.
- Supporting the continuity of reporting by preserving existing or delivering new reporting capabilities.

Planned Data Management Activities Supporting the Department of Veterans Affairs (VA) Electronic Health Record (EHR) Modernization

Data Management Activities

Supporting the continuity of reporting

Intended to help mitigate gaps in mission-critical reporting capabilities that support patient care, operations, and research.



Migrating data

Intended to help VA clinicians transition to the new EHR system and retain access to their patients' historical health data.

Source: GAO analysis of VA documentation. | GAO-22-103718

VA has made progress toward implementing its planned data management activities. Consistent with its plans, the department migrated selected data to the new EHR system prior to the initial system deployment in October 2020. Although these efforts included testing intended to help ensure migrated data were accurate and matched expected results, VA's analyses and GAO's work indicated that clinicians experienced challenges with the quality of migrated data, including their accessibility, accuracy, and appropriateness. For example, a VA report issued after the initial deployment identified risks to patient safety in the new system related to incomplete data migration. The challenges occurred, in part, because the department did not establish performance measures and goals for migrated data quality. Until VA uses such measures and goals to better ensure the quality of migrated data, the department could deploy a new EHR system that does not meet clinicians' needs and poses risks to the continuity of patient care.

In addition, consistent with its plans, VA began preserving existing reporting capabilities and delivering new ones. The department also took steps to identify and engage stakeholders, including incorporating their requirements into plans for reporting continuity. Nevertheless, the department did not use a key tool known as a stakeholder register to identify and engage all key stakeholders. Consequently, certain relevant stakeholders were overlooked. By using a stakeholder register, the department would be better positioned to meet their continuity of reporting needs.

Contents

Letter		1
	Background	6
	VA Began Implementing Data Migration Plans, but Did Not Ensure Data Quality	14
	VA Began Implementing Reporting Plans, but Did Not Use a Key Project Management Tool to Manage Stakeholders	23
	VA's Plans Described Expected Use of JLV During the New EHR System Deployment	27
	VA Coordinated Data Management Activities with DOD Using Joint Processes and Decision-Making Groups	30
	Conclusions	32
	Recommendations for Executive Action	33
	Agency Comments	33
Appendix I	Objectives, Scope, and Methodology	36
Appendix II	Comments from the Department of Veterans Affairs	43
Appendix III	GAO Contact and Staff Acknowledgments	47
Table		
	Table 1: Examples of Department of Veterans Affairs (VA) and Department of Defense (DOD) Decision-Making Groups Involved in Data Management Coordination	31
Figures		
	Figure 1: Military Service and Veteran Health Data in the Department of Veterans Affairs (VA)/Department of Defense (DOD) Shared Electronic Health Record System	7
	Figure 2: Simplified View of Cerner Products Supporting Health Data Management at a Department of Veterans Affairs (VA) Electronic Health Records Modernization (EHRM) Deployment Site	11
	Figure 3: Planned Initial and Ongoing Data Transfer Activities for the Department of Veterans Affairs' (VA) Electronic Health Record (EHR) Modernization Data Migration	17

Figure 4: Department of Veterans Affairs (VA) Planned Activities for Supporting the Continuity of Reporting for the Electronic Health Records (EHR) Modernization	25
Figure 5: Planned Use of JLV at Department of Veterans Affairs (VA) Sites Using Legacy and New EHR Systems	29

Abbreviations

Cerner	Cerner Government Services, Inc.
DOD	Department of Defense
EHR	electronic health record
EHRM	electronic health record modernization
FEHRM	Federal Electronic Health Record Modernization
JLV	Joint Longitudinal Viewer
MHS GENESIS	Military Health System GENESIS
OEHRM	Office of Electronic Health Record Modernization
<i>PMBOK® Guide</i>	<i>A Guide to the Project Management Body of Knowledge</i>
VA	Department of Veterans Affairs
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
VistA	Veterans Health Information Systems and Technology Architecture

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February 1, 2022

Congressional Requesters

Within the Department of Veterans Affairs (VA), the Veterans Health Administration (VHA) operates one of the nation’s largest health care systems, serving about 9 million patients annually. For more than 30 years, VA has relied on the Veterans Health Information Systems and Technology Architecture (VistA) to provide electronic health record (EHR) system capabilities and support the delivery of health care to veterans.¹ VA has also relied on the exchange of data from the Department of Defense’s (DOD) EHR system for information about veterans’ health during their military service. We have previously reported that VA’s legacy EHR system, VistA, does not fully support the department’s need to exchange data electronically with DOD.²

To improve the exchange of data between their systems, VA has worked with DOD to respond to provisions in the National Defense Authorization Act for Fiscal Year 2008. These provisions required the departments to jointly develop and implement fully interoperable EHR systems or capabilities and establish an Interagency Program Office as a single point of accountability for their efforts.

In addition, in 2013, VA and DOD developed the Joint Legacy Viewer—since renamed the Joint Longitudinal Viewer (JLV)—a web-based

¹VistA supports a complex set of clinical and administrative capabilities and contains an EHR for each patient (i.e., a collection of information about the health of an individual or the care provided, such as patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports). VistA has evolved into a technically complex system that supports health care delivery at more than 1,500 locations, including VA medical centers, outpatient clinics, community living centers, and VA vet centers. Customization of the system by local facilities has resulted in about 130 clinical versions of VistA—referred to as instances.

²GAO, *Electronic Health Records: Outcome-Oriented Metrics and Goals Needed to Gauge DOD’s and VA’s Progress in Achieving Interoperability*, [GAO-15-530](#) (Washington, D.C.: Aug. 13, 2015); *Electronic Health Records: DOD and VA Should Remove Barriers and Improve Efforts to Meet Their Common System Needs*, [GAO-11-265](#) (Washington, D.C.: Feb. 2, 2011); *Electronic Health Records: DOD and VA Efforts to Achieve Full Interoperability Are Ongoing; Program Office Management Needs Improvement*, [GAO-09-775](#) (Washington, D.C.: July 28, 2009); and *Electronic Health Records: DOD’s and VA’s Sharing of Information Could Benefit from Improved Management*, [GAO-09-268](#) (Washington, D.C.: Jan. 28, 2009).

application that provides a near real-time and chronological view of health data contained in the departments' separate EHR systems. Further, VA has undertaken various attempts over the past two decades to modernize VistA, but its efforts have fallen short of completion at a high cost to the department.

In June 2017, the then-Secretary of Veterans Affairs announced that the department would redirect its EHR modernization (EHRM) to deploy the same system that DOD is in the process of deploying.³ The two departments' respective modernization efforts are intended to deliver a single, seamlessly integrated (i.e., shared) EHR system, which is based on a Cerner Government Services, Inc. (Cerner) commercial EHR product known as Millennium. Established in June 2018, VA's Office of Electronic Health Record Modernization (OEHRM) is responsible for overseeing and directing the department's EHRM. VA intends for OEHRM to coordinate with its Office of Information Technology and VHA leadership—specifically, VA's Chief Information Officer and VHA's Under Secretary for Health—under the direction of an Executive Director.⁴ The Executive Director reports directly to the VA Deputy Secretary.

Although health data are necessary to provide critical services and benefits to veterans, VA has historically faced challenges in managing these data.⁵ Therefore, it is imperative that the department carefully plan data management activities that will provide comprehensive patient information and enable consistent, high-quality care in line with VA's mission and vision for EHRM. This includes activities that support the continuity of patient care and VHA operations, such as migrating quality data to the new system. It also includes supporting the continuity of reporting, meaning that stakeholders should continue to have access to

³DOD refers to its new EHR system as Military Health System (MHS) GENESIS, which the department began deploying in February 2017. Within the Department of Homeland Security, the U.S. Coast Guard is also deploying this system and began doing so in August 2020.

⁴The Office of Information Technology and VHA serve respectively as the technical and functional leaders for the department's health care delivery. Together they have worked to develop and maintain VistA for decades.

⁵Data management refers to a set of disciplines and techniques used to process, store, and organize data. According to VA's Enterprise Data Strategy, top data management challenges include identifying and using authoritative data sources, poor data quality, difficulty linking data across isolated sources, variations in reporting, and immature data governance. Department of Veterans Affairs, *Enterprise Data Strategy: A Vision for the Future* (Washington, D.C.: January 2021).

reporting capabilities that are necessary to carry out their patient care, operations, and research functions.⁶

You asked us to examine VA's data management plans for its EHRM. Our specific objectives were to (1) describe the department's plans for migrating data to the new EHR system and determine the extent to which VA has implemented those plans, (2) describe the department's plans for EHRM continuity of reporting and determine the extent to which VA has implemented those plans, (3) describe the expected use of JLV defined in the department's data management plans, and (4) describe how VA coordinated its EHRM data management activities with DOD.

To describe the plans that VA developed to migrate data to the new EHR system and the extent to which the department has implemented those plans, we obtained and reviewed EHRM program documentation, including plans prepared by OEHRM and Cerner. We also reviewed documentation relating to the results of the initial system deployment at the Mann-Grandstaff VA Medical Center in Spokane, Washington, such as progress reports, test findings, and analyses.

Using this information, we compared VA's data migration efforts to its plans for the initial system deployment. In addition, we compared the department's data migration efforts to guidance for ensuring data quality outlined in the Office of Management and Budget's Federal Data Strategy.⁷ We also compared these efforts to practices for measuring

⁶VA's reporting capabilities are varied and support a wide range of stakeholders and uses across the department. Examples of these reporting capabilities include registries that collect information over time about patients with certain health conditions, such as traumatic brain injury; reporting and analytics tools that identify patients at risk for suicide, hospitalization, or illness, and measure quality of care; and research programs, such as the Million Veteran Program, which uses data about patients to understand how genes affect health and illness.

⁷The Federal Data Strategy is a framework of operational principles and best practices that are intended to enable government to fully leverage data as a strategic asset. Among other things, the strategy outlines principles that are intended to guide federal data management activities and inform agencies in developing and executing all aspects of the data lifecycle. Office of Management and Budget, *Federal Data Strategy – A Framework for Consistency*, Memorandum M-19-18 (Washington, D.C.: June 4, 2019).

performance,⁸ such as those identified by GAO,⁹ as well as those identified in the Project Management Institute's *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*.¹⁰ Further, we interviewed cognizant officials from OEHRM, including the Chief Technology and Integration Officer and Chief Medical Officer, as well as

⁸Performance measurement is the ongoing monitoring and reporting of program accomplishments toward pre-established goals, for any activity, project, function, or policy that has an identifiable purpose or set of objectives. Performance measures include those that address the results of program products and services. GAO, *Performance Measurement and Evaluation: Definitions and Relationships (Supersedes GAO-05-739SP)*, [GAO-11-646SP](#) (Washington, D.C.: May 2, 2011).

⁹The Government Performance and Results Act of 1993, as amended by the Government Performance and Results Modernization Act of 2010, established a framework for federal government and agency performance plans, performance measurement, reporting, and federal government outcome-oriented priority goals. These requirements are applicable at the department or agency level or to certain agency activities described in the law. However, practices regarding performance measures and goals are important management tools applicable to all levels of an agency, including the program, project, or activity level, consistent with leading management practices and internal controls related to performance monitoring. We have previously reported that performance measurement allows organizations to track progress in achieving their goals and gives managers crucial information to identify gaps in program performance and plan any needed improvements. In addition, according to *Standards for Internal Control in the Federal Government*, managers should design activities to achieve objectives and respond to risks by, for example, comparing actual performance to planned or expected results and analyzing significant differences. The GPRA Modernization Act of 2010, 5 U.S.C. § 306, 31 U.S.C. §§ 1115-1116 & 1120-1124; GAO, *VA Medical Centers: VA Should Establish Goals and Measures to Enable Improved Oversight of Facilities' Conditions*, [GAO-19-21](#) (Washington, D.C.: Nov. 13, 2018); *Digital Service Programs: Assessing Results and Coordinating with Chief Information Officers Can Improve Delivery of Federal Projects*, [GAO-16-602](#) (Washington, D.C.: Aug. 15, 2016); *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014); *DHS Training: Improved Documentation, Resource Tracking, and Performance Measurement Could Strengthen Efforts*, [GAO-14-688](#) (Washington, D.C.: Sept. 10, 2014); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

¹⁰Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition* (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute is a not-for-profit association that, among other things, provides standards for managing various aspects of projects, programs, and portfolios.

system users from the initial deployment site regarding VA's data migration plans and implementation.¹¹

To describe the plans that VA developed to support the continuity of reporting for EHRM and the extent to which the department implemented those plans, we obtained and reviewed EHRM documentation, including plans, performance work statements, requirements documents, and Cerner contract deliverables that described VA's approach for continuity of reporting. We also reviewed documentation regarding the results of the initial system deployment, such as progress reports. Using this information, we compared the department's activities to support continuity of reporting to the activities identified in its plans.

We also compared the department's reporting continuity efforts to guidance for identifying and engaging stakeholders as outlined in the Office of Management and Budget's Federal Data Strategy¹² and the Project Management Institute's *PMBOK® Guide*.¹³ Further, we interviewed cognizant officials from OEHRM and VHA.

To describe the expected use of JLV defined in the department's data management plans, we reviewed VA EHRM program plans and documentation related to data management, system architecture and design, and system capabilities. We also reviewed JLV user manuals to understand how VA intended for the application to provide clinicians with access to their patients' health data. Further, we interviewed knowledgeable officials, including the OEHRM Chief Technology and Integration Officer.

To describe how VA coordinated its EHRM data management activities with DOD, we reviewed documentation prepared by joint VA-DOD decision-making groups for EHRM, such as the Joint Data, Analytics, Reporting, and Registry Board. These documents included charters, memoranda, and business rules for managing joint risks, issues, and

¹¹Within OEHRM, the Technology and Integration Office is responsible for providing technical leadership, management, and oversight of IT. The Chief Medical Office is responsible for overseeing strategy and planning efforts for change management, user testing and training, and business process re-engineering. It also leads communication efforts for the end users and system deployment.

¹²Office of Management and Budget, Memorandum M-19-18.

¹³Project Management Institute, Inc., *PMBOK® Guide—Sixth Edition*.

opportunities. In addition, we interviewed knowledgeable officials from OEHRM and the joint decision-making groups.

We assessed the reliability of computer-processed data from EHRM test findings, risk and issues registers, and a trouble ticket extract, as well as data migration and reporting capability progress reports. To do so, we reviewed related documentation and interviewed knowledgeable officials about the quality control procedures used to assure accuracy and completeness of the data. For reporting capability progress reports, we also examined the data for obvious outliers, incomplete entries, or unusual entries. We determined that the data used to support the findings in this report were sufficiently reliable for the purposes of our reporting objectives. See appendix I for a more detailed discussion of our objectives, scope, and methodology.

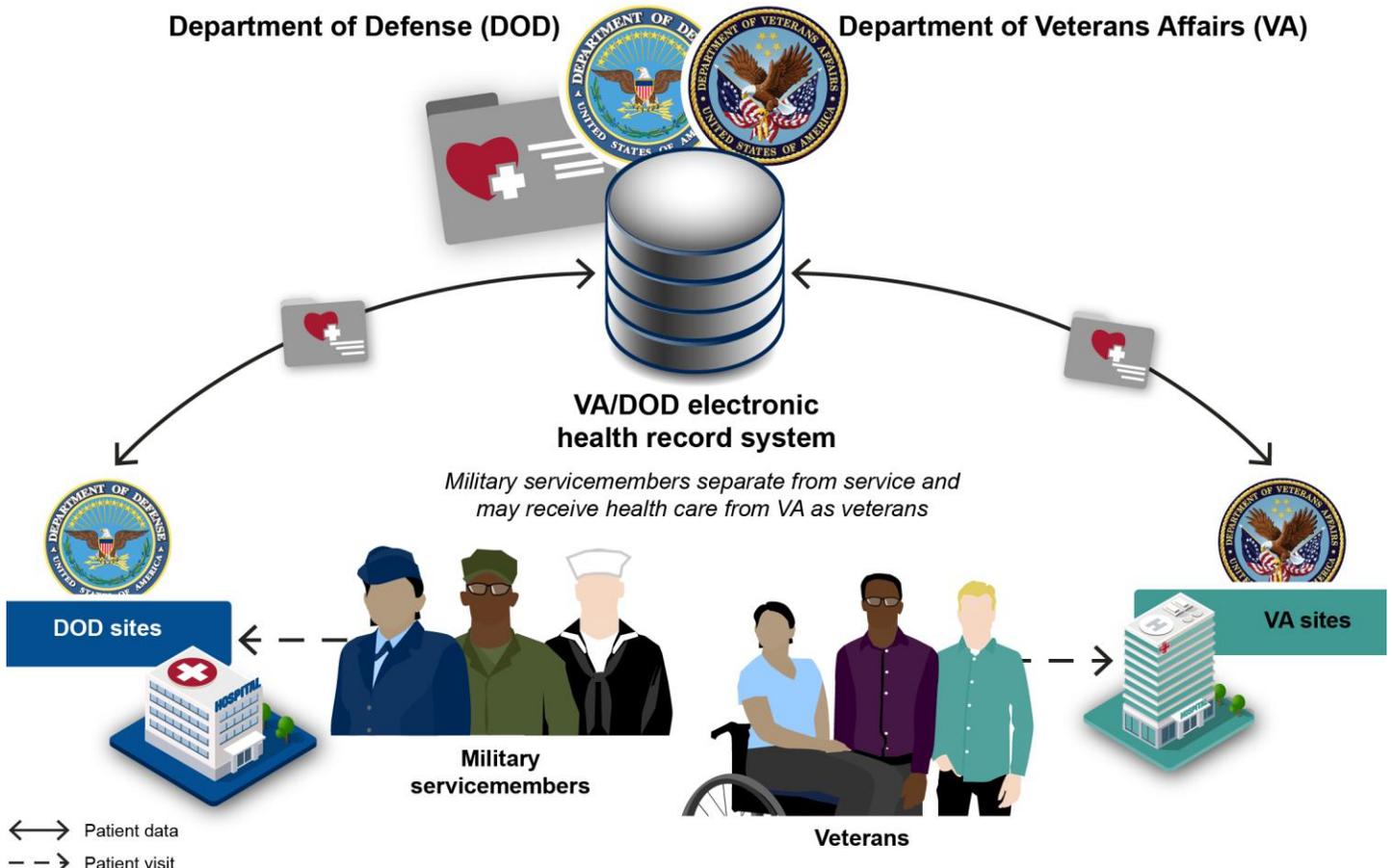
We conducted this performance audit from August 2019 to February 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

VA's EHRM aims to improve health care delivery for veterans and facilitate the seamless sharing of health data between VA and DOD as servicemembers transition to veteran status. According to VA's then-Secretary, implementing a single shared EHR system is intended to enable seamless care between VA and DOD without the exchange and reconciliation of data between two separate systems. As such, the new, shared system is to include records of veterans' health care at VA sites in addition to care received during their military service at DOD sites.¹⁴ Figure 1 depicts how military service and veteran health data are expected to be available in the shared EHR system that the departments are deploying as part of their respective modernization efforts.

¹⁴VA plans to deploy the new EHR system to sites across its health care system, which includes VA medical centers, outpatient clinics, community living centers, and VA Vet Centers. DOD's deployment sites include military hospitals and clinics, known as medical treatment facilities.

Figure 1: Military Service and Veteran Health Data in the Department of Veterans Affairs (VA)/Department of Defense (DOD) Shared Electronic Health Record System



Source: GAO analysis of VA documentation; images: AlexZel/stock.adobe.com. | GAO-22-103718

The departments agreed to coordinate decision-making and oversight for the new, shared EHR system. In December 2019, they re-chartered the Interagency Program Office as the Federal Electronic Health Record Modernization (FEHRM) Program Office to serve as a single point of accountability for the shared system, including the execution of joint functions and operations.

VA Has Revised Its Deployment Schedule for the New EHR System

As part of VA's EHRM, the department contracted with Cerner in May 2018 to provide, host, and deploy its new EHR system.¹⁵ VA's contract included Cerner's commercial EHR product, Millennium, as well as HealthIntent, a cloud-based software product that aggregates health data from multiple sources.¹⁶

VA's schedule and approach for deploying the new EHR system has undergone multiple changes since the department first announced its deployment plan in October 2018:

- **Original plan.** VA planned to deploy the new system at sites in stages based on their geographical location and over a 10-year period. According to the department's initial schedule, VA expected to begin deploying the new system in March and April 2020 at sites within VHA's Veterans Integration Service Network 20 (VISN 20).¹⁷ These initial deployment sites were the Mann-Grandstaff VA Medical Center in Spokane, Washington, and the VA Puget Sound Health Care System in Seattle, Washington.¹⁸
- **Revised initial deployment plan.** In August 2019, VA revised its plans for initial system deployment to include two phases, known as capability sets 1.0 and 2.0. Capability set 1.0 was to deploy in March 2020 at the Mann-Grandstaff VA Medical Center and capability set 2.0 was to deploy in November 2020 at the Puget Sound Health Care System.
 - Capability set 1.0 includes key EHR functionalities necessary to implement the system at a less complex facility.

¹⁵Host refers to providing a data center for the new EHR system.

¹⁶Cloud computing enables software and data to reside on vast numbers of servers connected over the internet, rather than on servers at the physical location of an individual, company, or other organization.

¹⁷VHA is divided into areas called Veterans Integration Service Networks (VISNs). There are currently 18 VISNs throughout VHA based on geographic location. VISNs provide oversight and guidance to the VA Medical Centers and VA Health Care Systems within their area and are sometimes called a "network." VISN 20 includes medical centers and community-based outpatient clinics in the states of Alaska, Washington, Oregon, most of the state of Idaho, and one county each in Montana and California.

¹⁸The Puget Sound Health Care System includes two divisions, Seattle and American Lake. VA manages the two divisions in an integrated manner.

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- Capability set 2.0 includes capability set 1.0 functionalities and remaining functionalities necessary to implement the system at a highly complex facility.
 - **Initial system deployment delays.** In February 2020, VA postponed the initial system deployment at the Mann-Grandstaff VA Medical Center until July 2020 to establish a more complete training environment and build interfaces between the new EHR system and other VA systems. In March 2020, VA further postponed the initial system deployment to focus on the department's response to Coronavirus Disease 2019.
 - **Revised timeline and new functionality.** In August 2020, VA announced a revised timeline for deploying the new EHR system. For example, the department revised the date for its initial deployment at the Mann-Grandstaff VA Medical Center to October 24, 2020. This initial deployment included capability set 1.0 and some additional veteran-facing functionality (e.g., consolidated mail order pharmacy and online prescription refill), known as capability set 1.1.

Following the October 2020 initial system deployment at the Mann-Grandstaff VA Medical Center, VA paused EHRM implementation to conduct a strategic review of EHRM between March and June 2021.¹⁹ After the strategic review, in November 2021, the department issued a progress report that described its revised EHRM deployment schedule through fiscal year 2024. According to the report, VA planned to restart EHRM deployment in March 2022, beginning with the Chalmers P. Wylie VA Ambulatory Care Center in Columbus, Ohio.²⁰ In addition, the report stated that VA continues to develop its long-term EHRM deployment schedule. In January 2022, VA announced that it would delay the Columbus, Ohio deployment from March 2022 to April 2022 due to a surge in Coronavirus Disease 2019 cases affecting the workforce and community.

¹⁹VA summarized the results of its strategic review in the *Electronic Health Record Comprehensive Lessons Learned* report. The report described eight challenge areas for EHRM, as well as plans and progress toward addressing those challenges. In addition, the report proposed a way forward and performance measures that the department expected to ensure the success of EHRM while preventing and reducing issues at future deployment sites. We have work under way to assess the results of VA's strategic review. Department of Veterans Affairs, *Electronic Health Record Comprehensive Lessons Learned* (Washington, D.C.: July 2021).

²⁰Department of Veterans Affairs, *Electronic Health Record Comprehensive Lessons Learned Progress Update*, (Washington, D.C.: November 2021).

VA Has Planned to Manage Health Data Using Cerner Products

VA relies on data about veterans and their health care to carry out its mission. In particular, VA clinicians have relied on data stored in VistA to provide health care services. The department has also relied on health data to support reporting capabilities for patient care, operations, and research functions. To support these reporting capabilities, historically VA has transferred health data from VistA into its Corporate Data Warehouse, which resides in VA's National Data Center.²¹

VA's EHRM is expected to replace most components of the department's legacy EHR system, including the management of health data. According to the department's EHRM Architecture and Design Plan, VA expects to manage health data using the two key Cerner products—Millennium EHR and HealthIntent, as explained below:²²

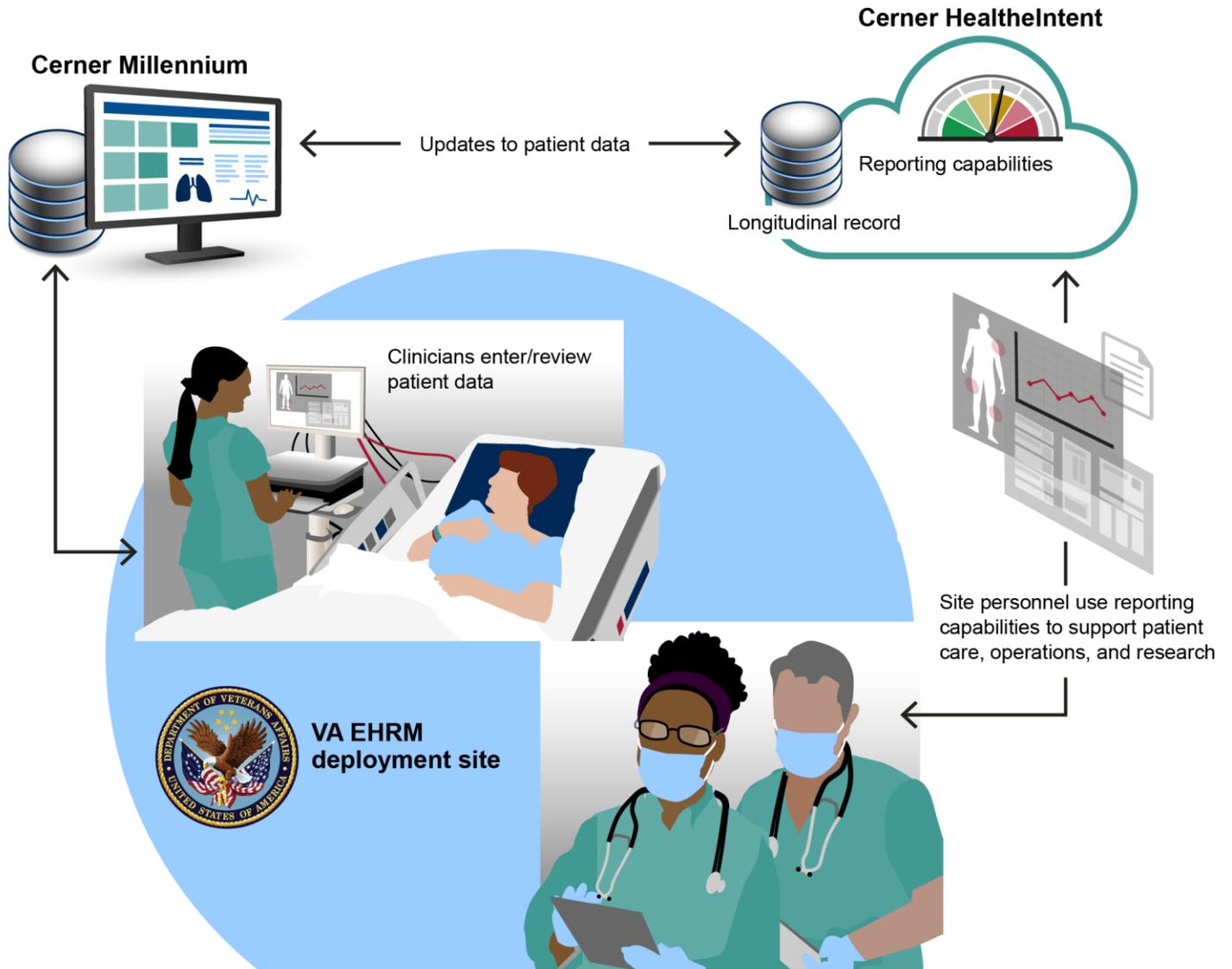
- Cerner Millennium is expected to provide users, such as clinicians, with access to their patients' health data. Millennium is also expected to support clinical capabilities, such as ordering laboratory tests and medications, documenting notes about the delivery of care, and scheduling appointments.
- Cerner HealthIntent is expected to aggregate health data from multiple sources, including VistA and Millennium, to create a single record for each patient (known as the longitudinal record). Further, data in the longitudinal record are expected to support reporting capabilities in HealthIntent and Millennium, such as patient care recommendations, clinical studies, and quality of care analyses, among other things.

Figure 2 provides a simplified view of how Cerner Millennium and HealthIntent are intended to support health data management at VA EHRM deployment sites.

²¹VA's Corporate Data Warehouse is a database built to store and make accessible up-to-date data from VistA and other VA systems. The department's National Data Center is located in Austin, Texas.

²²Department of Veterans Affairs, *Electronic Health Record Modernization Architecture and Design Plan* (Washington, D.C.: Jan. 31, 2019).

Figure 2: Simplified View of Cerner Products Supporting Health Data Management at a Department of Veterans Affairs (VA) Electronic Health Records Modernization (EHRM) Deployment Site



Source: GAO analysis of VA documentation. | GAO-22-103718

VA and Cerner Share Responsibility for Planning and Implementing EHRM Data Management Activities

OEHRM is responsible for working with Cerner and VA subject matter experts to plan and implement EHRM, including data management activities.²³ Toward this end, the department established 18 EHR councils comprised of VHA clinicians, staff, and other subject matter experts to coordinate with Cerner and provide input regarding data and reporting capabilities for EHRM, among other things. Specific data management activities discussed in VA's EHRM plans include the following:

- **Migrating data to the new EHR system.** The department determined that, to ensure the continuity of patient care and VHA operations, it would be necessary to populate the new EHR system with the same data available in the legacy EHR system (i.e., VistA). To do so, VA planned to migrate selected data from the legacy system to Cerner HealthIntent and Millennium prior to the new system's initial and subsequent deployments.
- **Supporting the continuity of reporting.** The department determined that deploying a new EHR system would result in significant gaps in its reporting capabilities.²⁴ As discussed earlier, VA had been fully relying on health data transferred from VistA to its Corporate Data Warehouse to support reporting capabilities, including those that use comprehensive health data from all VA sites. As noted in the department's plans, VA anticipated gaps in these reporting capabilities because data entered in the new EHR system were not to be automatically transferred to the Corporate Data Warehouse.

To address these gaps and support the continuity of VA's critical reporting capabilities, the department planned to deliver certain reporting capabilities via Millennium and HealthIntent, or otherwise take action to preserve them in the Corporate Data Warehouse.

GAO Has Previously Reported on VA Health Information Technology Management and EHRM Challenges

In 2015, we designated VA health care as a high-risk area for the federal government, and we continue to be concerned about the department's ability to ensure that its resources are used cost-effectively and efficiently

²³VHA serves as the functional leader for the department's health care delivery and is a key EHRM stakeholder.

²⁴In June 2019, VA determined that EHRM would affect about 80 percent of its reporting capabilities.

to improve veterans' timely access to health care.²⁵ In part, we identified limitations in the capacity of VA's existing information technology systems, including the outdated, inefficient nature of key systems and a lack of system interoperability, as contributors to the department's challenges related to health care. In our 2021 update to the high-risk series, we stressed that the department should demonstrate commitment to addressing its information technology challenges by stabilizing senior leadership, building capacity, and finalizing its action plan for addressing our recommendations and establishing metrics and mechanisms for assessing and reporting progress.

Our numerous reports over the last decade have highlighted challenges that VA has faced in modernizing VistA.²⁶ For example,

- In June 2020, we reported on the system configuration process for EHRM.²⁷ We noted that VA's decision-making procedures were generally effective, but the department did not always ensure key stakeholder involvement.

We recommended that VA ensure the involvement of all relevant deployment site stakeholders in the EHR system configuration decision process. The department concurred with our

²⁵GAO maintains a high-risk program to focus attention on government operations that it identifies as high risk due to their greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges. VA's information technology issues were highlighted in our high-risk report in 2015, 2017, 2019, and 2021. See GAO, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, [GAO-21-119SP](#) (Washington, D.C.: Mar. 2, 2021); *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019); *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, [GAO-17-317](#) (Washington, D.C.: Feb. 15, 2017); and *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015).

²⁶See GAO, *Electronic Health Records: VA Has Made Progress in Preparing for New System, but Subsequent Test Findings Will Need to Be Addressed*, [GAO-21-224](#) (Washington, D.C.: Feb. 11, 2021); *Electronic Health Records: Ongoing Stakeholder Involvement Needed in the Department of Veterans Affairs' Modernization Effort*, [GAO-20-473](#) (Washington, D.C.: June 5, 2020); *Electronic Health Records: VA Needs to Identify and Report System Costs*, [GAO-19-125](#) (Washington, D.C.: July 25, 2019); *VA Health Information Technology Modernization: Historical Perspective on Prior Contracts and Update on Plans for New Initiative*, [GAO-18-208](#) (Washington, D.C.: Jan. 18, 2018); [GAO-15-530](#); *Electronic Health Records: VA and DOD Need to Support Cost and Schedule Claims, Develop Interoperability Plans, and Improve Collaboration*, [GAO-14-302](#) (Washington, D.C.: Feb. 27, 2014); and [GAO-11-265](#).

²⁷[GAO-20-473](#).

recommendation and stated that it intended to improve subject matter expert identification and involvement. However, as of December 2021, the department had not fully implemented our recommendation.

- In February 2021, we reported that VA had made progress toward deploying the new EHR system by making configuration decisions, developing capabilities and interfaces, completing testing events, and deploying the system at the Mann-Grandstaff site in October 2020. However, we noted that the department was at risk of developing a system that may not perform as intended or could negatively impact the likelihood of successful adoption by users if critical and high severity test findings (that could result in system failure) were not resolved prior to future deployments.²⁸

We made two recommendations in February 2021, including that VA postpone deployment of the new EHR system at planned sites until any resulting critical and high severity test findings are appropriately addressed. The department concurred with our recommendations and stated that it planned to continue to test and appropriately adjudicate all critical and high severity test findings prior to future deployments. As discussed earlier, VA conducted a strategic review of EHRM following the initial system deployment. This review and the department's subsequent decision to pause implementation of the new EHR system are consistent with our previous recommendations.

VA Began Implementing Data Migration Plans, but Did Not Ensure Data Quality

VA developed and began implementing plans for EHRM data migration. Specifically, the department performed planned data migration activities for the initial system deployment at the Mann-Grandstaff VA Medical Center. However, VA did not establish and use performance measures and goals to help ensure that the quality of migrated data supported clinicians' needs for accessible, accurate, and appropriate data in the new EHR system.

VA Developed Plans to Migrate Data to the New EHR System

In conjunction with Cerner, VA's OEHRM developed a number of plans to support the migration of data from VistA to the new EHR system. Specifically, data migration plans prepared by OEHRM included OEHRM's Data Migration Plan and Design and Architecture Plan. Cerner prepared plans, including a data management plan, data migration plan,

²⁸[GAO-21-224](#).

and master test plan, described how Cerner would approach and carry out its responsibilities as a complement to OEHRM's plans.

Collectively, VA's plans discussed the department's overall data migration strategy and key activities, including data selection and mapping,²⁹ initial and ongoing transfer,³⁰ transformation,³¹ and testing.³² The strategy outlined in VA's plans called for migrating selected VistA data to two Cerner products, HealthIntent and Millennium, based on needs the EHR councils identified. The department planned to migrate selected data prior to the initial system deployment and migrate additional data as needed for subsequent deployments. In addition, the plans called for migrating data to the Millennium EHR on a site-by-site basis, as the new system is deployed at each site. As such, EHRM data migration is expected to continue until the new system has been fully deployed.

VA's plans discussed the process and results of the department's data selection and mapping activities, which informed subsequent migration activities. Based on input from the EHR councils, the department identified data elements in HealthIntent and Millennium that should be pre-loaded with data from VistA. Clinical and technical subject matter experts then mapped those elements to equivalent data in VistA.

According to the plans, VA's EHR councils initially prioritized data that would be critical for the continuity of patient care at the time of the initial system deployment. The plans stated that additional data would be selected for migration prior to subsequent deployments. As a result of the department's selection and mapping activities, the plans identified specific VistA data domains needing to be migrated prior to the initial system

²⁹Data selection and mapping involves identifying data elements in the target system (i.e., HealthIntent and Millennium) that should be pre-loaded with data from the source system (i.e., VistA), such as historical patient medical records, ahead of the system deployment.

³⁰Initial data transfer involves extracting selected data from the source system and loading that data into the target system. Ongoing data transfer involves establishing and executing a mechanism to transfer updated or new data from the source system to the target system on an ongoing basis.

³¹Data transformation involves various steps needed to convert or standardize data to meet specifications in the target system.

³²Data testing involves validating that migrated data are accurate and match the expected results of transformation.

deployment.³³ Specifically, the plans called for migrating 14 domains from VistA to HealthIntent and a subset of those 14 domains (six) to Millennium.³⁴

To facilitate the initial transfer of the selected data to HealthIntent and Millennium, VA's plans called for the department to establish a staging environment in Cerner's Kansas City, Missouri, data center to house data migrated from VistA. After establishing the staging environment, the plans stated that the department would create a copy of selected VistA data from the department's National Data Center in Austin, Texas, and perform an initial transfer of that data to the staging environment in Cerner's data center. Once the copied VistA data were transferred to the Cerner staging environment, selected data would be available for initial transfer to HealthIntent and subsequently to Millennium.

In addition, for the initial system deployment at the Mann-Grandstaff VA Medical Center in Spokane, Washington, the department further narrowed the scope of selected data for migration to Millennium. For the six data domains planned for migration to Millennium prior to the initial deployment, VA chose to include only active Mann-Grandstaff patients. The department also narrowed the scope of those data to include the most clinically relevant fields and date ranges, based on input from the EHR councils.

To facilitate ongoing data transfer, VA's plans called for establishing mechanisms to ensure that new or updated data in VistA remain synchronized with Cerner's staging environment, HealthIntent, and Millennium. For ongoing transfer to Millennium in particular, the plans described two methods for updating existing patient records in Millennium on an ongoing basis. Initially, the process will require providers to incorporate updates manually into their patients' record. The plans

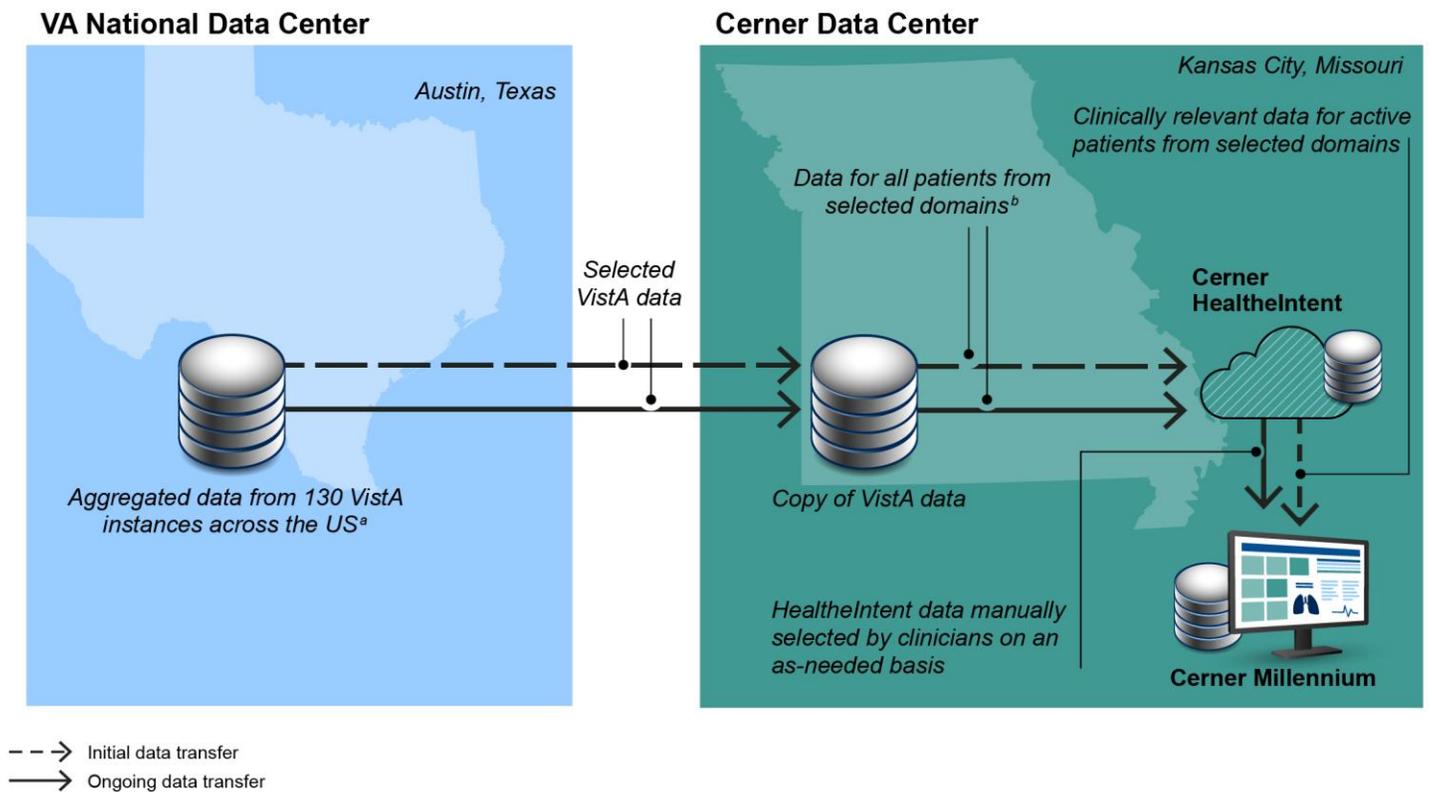
³³Data domain refers to data grouped by subject matter. For example, data collected about patient allergies or immunizations would be combined into an allergy domain and an immunization domain respectively.

³⁴The 14 data domains selected for migration to HealthIntent prior to the initial system deployment were problems, allergies, outpatient medications, procedures, immunizations, patient demographics, patient encounters, health factors, chemistry/hematology lab results, anatomic pathology lab results, radiology reports, vital signs, diagnoses, and image metadata. The six data domains selected for migration to Millennium prior to the initial system deployment were problems, allergies, outpatient medications, procedures, immunizations, and patient demographics.

indicated that VA expects to automate this ongoing data transfer activity with the deployment of capability set 2.0.³⁵

Figure 3 shows VA’s planned activities for the initial and ongoing transfer of data from VistA to HealthIntent and subsequently to Millennium.

Figure 3: Planned Initial and Ongoing Data Transfer Activities for the Department of Veterans Affairs’ (VA) Electronic Health Record (EHR) Modernization Data Migration



Source: GAO analysis of VA documentation. | GAO-22-103718

Notes:

^aVistA (Veterans Health Information Systems and Technology Architecture) has provided VA’s EHR system capabilities for over 30 years. Data migration activities are intended to support VA’s EHR modernization, which includes Cerner Government Services, Inc. EHR product (Millennium) and cloud-based data aggregation product (HealthIntent).

^bData domain refers to data grouped by subject matter, such as allergies or immunizations.

³⁵Specifically, capability set 2.0 is expected to include a new capability, known as Seamless Exchange, which is intended to automatically reconcile Millennium records to reflect updates to certain patient data.

Although the bulk of data planned for migration to HealthIntent and Millennium was expected to be transferred using this process, VA's plans also identified data that needed to be migrated to HealthIntent or Millennium via alternative processes. This included directly transferring certain primary care management data directly from the source (VA's Primary Care Management Module) to HealthIntent.³⁶ The department also planned to migrate certain time-sensitive data, such as future appointments and active outpatient prescriptions, directly from VistA or other VA applications to Millennium.

VA's plans also discussed data transformation and testing activities. Specifically, the plans called for Cerner to transform data in HealthIntent and Millennium. Examples of these transformation activities include

- linking data for each patient and incorporating them into a comprehensive clinical summary (referred to as the HealthIntent longitudinal record),
- transforming certain VistA data to match standard terminologies,³⁷ and
- removing duplicated patient data as they are transferred to Millennium.³⁸

In addition, VA's plans called for the department and Cerner to coordinate in performing manual and automated validation testing of migrated data. For example, the EHRM Master Test Plan stated that testers should verify the accuracy of patient data in HealthIntent and Millennium and ensure information matches the expected results.

³⁶The Primary Care Management Module is a web-based application containing information about the assignment of health care staff and teams to their patients, among other things.

³⁷VA chose to map VistA patient data to various standard sets of terminology, such as Systematized Nomenclature of Medicine – Clinical Terms, which is meant for use in U.S. federal government systems for the electronic exchange of clinical health information.

³⁸According to OEHRM officials, a patient may have an allergy diagnosed and reported in their EHR from visits to multiple VistA-based medical facilities. To create a single allergy record containing only the most clinically relevant information, duplicated information should be excluded prior to transferring patient data to Millennium.

VA Performed Planned Data Migration Activities for the Initial System Deployment

VA began implementing its plans for data migration by performing key activities, including initial and ongoing transfer, transformation, and testing to migrate the selected data prior to the initial system deployment at the Mann-Grandstaff VA Medical Center in October 2020. To facilitate the key migration activities the department extracted selected VistA data from its National Data Center in Austin, Texas, and transferred an initial copy of that data to a staging environment in Cerner's Kansas City, Missouri, data center. VA completed this step in December 2019. This step was necessary to support the migration of data to HealthIntent and, subsequently, to Millennium. VA also established a mechanism to ensure that updates to VistA data would continue to be reflected in Cerner's copy.

Once the selected data were available in the Cerner data center, VA performed initial and ongoing data transfers to HealthIntent and subsequently to Millennium:

- **HealthIntent.** In May 2020 (5 months prior to the initial system deployment), VA performed the initial transfer of the selected VistA data to HealthIntent and, in doing so, established the ongoing transfer of data from those selected data domains.³⁹ According to data migration progress reports for EHRM, Cerner performed transformation activities on these data to meet selected industry and VA standards. As planned, Cerner also established a longitudinal record for each patient in HealthIntent.
- **Millennium.** In the weeks leading up to VA's initial system deployment at Mann-Grandstaff in October 2020, the department performed the initial transfer of selected data from HealthIntent to Millennium. Specifically, the department transferred selected clinically relevant data from six domains and for 81,901 (93 percent) of 88,449 active Mann-Grandstaff patients.⁴⁰ VA also transferred selected time-sensitive data, such as future appointments and active outpatient prescriptions, directly from VistA to Millennium before deploying the new system.

³⁹VA also established a mechanism for migrating data to HealthIntent that did not originate in VistA using a Cerner capability known as the HealthIntent Data Upload Utility.

⁴⁰According to VA, the remaining 7 percent of active patients had already been registered in the shared EHR system by DOD and were, therefore, excluded in accordance with VA's data migration plans.

In addition, VA implemented a mechanism to support the ongoing transfer of data to Millennium. Using this mechanism, clinicians can manually review data available in the HealthIntent longitudinal record and incorporate that information into a patient's record in Millennium.

VA also conducted data testing activities for the initial system deployment. Specifically, based on our review of testing findings and summaries, VA and Cerner conducted data validation testing for data migrated to HealthIntent and Millennium between January and October 2020.

VA Did Not Ensure the Quality of Data Migrated from the Legacy EHR System

Although VA performed data testing activities identified in its plans, the department did not ensure that the quality of data migrated to the new EHR system sufficiently met clinicians' quality needs. The Office of Management Budget's Federal Data Strategy highlights the importance of validating data quality, including their accessibility, accuracy, and appropriateness.⁴¹ Using performance measures to assess the quality of a product such as migrated data against established goals is a generally recognized project management practice and can help ensure that stakeholder needs and expectations are met.⁴² Our prior work has also stressed the importance of performance measurements for assessing the actual results of a program or activity.⁴³

VA's EHRM plans address the importance of data quality to ensure migration is successful and meets the needs of system users, such as clinicians. In particular, the *OEHRM Data Migration Plan* states that the thoughtful and accurate migration of data is an essential prerequisite to continuity of patient care and VHA operations. As discussed earlier, the department's migration plans described data testing approaches intended to validate that migrated data are accurate and match the expected results.

Our review of VA's post-deployment analyses and Cerner progress reports, corroborated by our reviews of trouble tickets and discussions with OEHRM officials and clinicians at the initial system deployment site,

⁴¹Office of Management and Budget, Memorandum M-19-18.

⁴²Project Management Institute, Inc., *PMBOK® Guide—Sixth Edition*.

⁴³[GAO-19-21](#); [GAO-16-602](#); [GAO-14-704G](#); [GAO-14-688](#); [GAO-05-927](#); [GAO/GGD-96-118](#).

revealed challenges with the quality of migrated data, including their accessibility, accuracy, and appropriateness, as described below:⁴⁴

- **Accessibility.** A VA analysis prepared after the initial deployment found that clinicians did not know what specific data could be accessed within the new EHR system. In addition, our interviews with clinicians and reviews of trouble ticket data identified instances where data expected to be migrated to the new system were not always accessible. One clinician provided us with an example, noting an inability to view patients' migrated immunizations data as a result of user roles within the system. The clinician added that the inability to view immunization data in the new system had resulted in confusion and raised patient safety concerns.
- **Accuracy.** According to a VA initial deployment analysis, migrated data, such as allergies, medications, and immunizations, were frequently duplicative or contained errors. Also, according to VA's *Electronic Health Record Comprehensive Lessons Learned* report, the department identified risks to patient safety in the new system related to incomplete data migration.⁴⁵ In addition, according to the report, portions of data migrated from the legacy EHR system had necessitated a need for manual intervention. This report did not contain further details on risks to patient safety or manual intervention resulting from data migration.

Clinicians we interviewed echoed the concerns with the accuracy of the migrated data. For example, a clinician noted instances where migrated data required manual clean up, though this clinician had not encountered migrated data that were mistakenly associated with the wrong patient. According to another clinician, inaccuracies in the data required additional steps to verify and manually enter the data, which had created barriers to patient care, inefficiencies in workflow, and a significantly increased workload.

- **Appropriateness.** OEHRM's then-Chief Medical Officer acknowledged that VA had selected a greater volume of certain data for migration, such as medications, than clinicians needed. As a result, the large volume of migrated data presented in the new EHR system made it difficult for clinicians to read their patients' records. In addition, a progress report on data migration issued by Cerner after

⁴⁴Trouble tickets are requests for assistance submitted to the Cerner help desk.

⁴⁵Department of Veterans Affairs, *Electronic Health Record Comprehensive Lessons Learned*.

the initial system deployment indicated that the procedures data selected for migration were not always relevant for clinicians. Clinicians we interviewed also described challenges with the appropriateness of migrated data. For example, according to the clinicians, certain medications and procedures data were accessible in the new system but were cluttered or not always relevant.

VA took steps to establish performance measures and goals for various aspects of EHRM. Specifically, the department required Cerner to coordinate with stakeholders to define objectives and measures of success for EHRM, including a set of key performance indicators related to veteran experience, workforce support, quality and safety, and health care operations. However, VA EHRM key performance indicators did not include measures of success for the quality of migrated data.

Moreover, OEHRM officials were not able to point to any specific performance measures for assessing the quality of migrated patient data, including their accessibility, accuracy, and appropriateness. Instead, OEHRM officials stated that they based their assessment of migrated data quality on data migration validation testing conducted prior to the initial deployment and feedback from system users following the initial deployment. Due in part to the VA's lack of specific quality performance measures and goals for migrated data, the department was not able to ensure that those data met clinicians' accessibility, accuracy, and appropriateness needs.

To its credit, following the initial system deployment, the department took steps and identified actions to better ensure the quality of migrated data. For example, VA incorporated clinician feedback regarding the accessibility and appropriateness of migrated data into its plans for future system deployments. According to VA's *Electronic Health Record Comprehensive Lessons Learned* report issued in July 2021, the department planned to create a post-migration data analytics team to help ensure the accuracy of migrated data.⁴⁶ The report also emphasized the importance of performance measurement for assessing EHRM success. With regard to data management in particular, the report proposed performance measures to assess the quality of foundational clinical data.

Nevertheless, even with these planned actions, the department has not yet established performance measures and goals targeting the quality of

⁴⁶Department of Veterans Affairs, *Electronic Health Record Comprehensive Lessons Learned*.

all data planned for migration to the new system. Until VA does so and uses resulting performance information to ensure that migrated data meet clinicians' needs for accessibility, accuracy, and appropriateness, the department will be challenged to objectively measure the success of planned actions to improve migrated data quality. It also risks deploying a new EHR system that does not effectively support the continuity of patient care.

VA Began Implementing Reporting Plans, but Did Not Use a Key Project Management Tool to Manage Stakeholders

VA relies on EHR data to support reporting capabilities for patient care, operations, and research functions. To support the continuity of these reporting capabilities for the department's EHRM, VA developed plans to preserve existing capabilities and deliver new ones. VA has begun work on reporting continuity activities identified in its plans. In addition, the department's plans and work so far have reflected stakeholder identification and engagement activities. Despite these efforts, certain stakeholders expressed concerns about their level of engagement. This occurred, in part, because VA did not use a key project management tool (i.e., a stakeholder register) to help identify and engage all relevant stakeholders for EHRM reporting continuity.

VA Developed and Began Implementing Plans for EHRM Reporting Continuity

In conjunction with Cerner, VA developed plans to support the continuity of reporting for the new EHR system. This includes EHRM program plans, Cerner performance work statements and deliverables, and EHRM Reports and Registries Workgroup documentation.⁴⁷ Collectively, the department's plans emphasized the need to provide stakeholders with continued access to critical reporting capabilities during EHRM implementation. Toward this end, the plans identified two complimentary activities: (1) preserve existing reporting capabilities in their current environment (VA's Corporate Data Warehouse), and (2) deliver new reporting capabilities in the new EHR system.

VA began to implement the activities in its plans for supporting the continuity of reporting:

- **Preserve existing reporting capabilities in their current environment (VA's Corporate Data Warehouse).** VA planned to incorporate selected data from the new EHR system into

⁴⁷The EHRM Reports and Registries Workgroup is part of the EHR council structure. Specifically, this workgroup is under the Quality, Safety, and Value Council, which is one of six EHR councils devoted to business and support services.

approximately 1,200 existing reporting capabilities.⁴⁸ In accordance with its plans, the department coordinated with Cerner to transfer selected data from the new EHR system to the Corporate Data Warehouse.

Moreover, VA made progress toward incorporating those data into its existing reporting capabilities. As of November 2021, the department had incorporated new data into 960 (nearly 80 percent) of 1,206 existing reporting capabilities. According to VA, the department expects to complete this work for approximately 95 percent of the capabilities by November 2022.

- **Deliver new reporting capabilities in the new EHR system.** VA planned to deliver 316 new custom reporting capabilities at the time of the initial deployment of the new system.⁴⁹ According to an EHRM Reports and Registries Workgroup progress report, VA delivered 228 (72 percent) of the 316 new reporting capabilities prior to the initial system deployment in October 2020. Since then, the department has continued working toward delivering the remaining capabilities, in addition to identifying new ones.⁵⁰

VA planned for these activities to continue throughout the modernization. In this regard, the department planned to increase the amount of data available for reporting capabilities in the Corporate Data Warehouse. The department also identified areas for improvement and additional reporting capability requirements for the new EHR system. For example, VA began working with DOD to identify reporting capabilities that can support both departments.

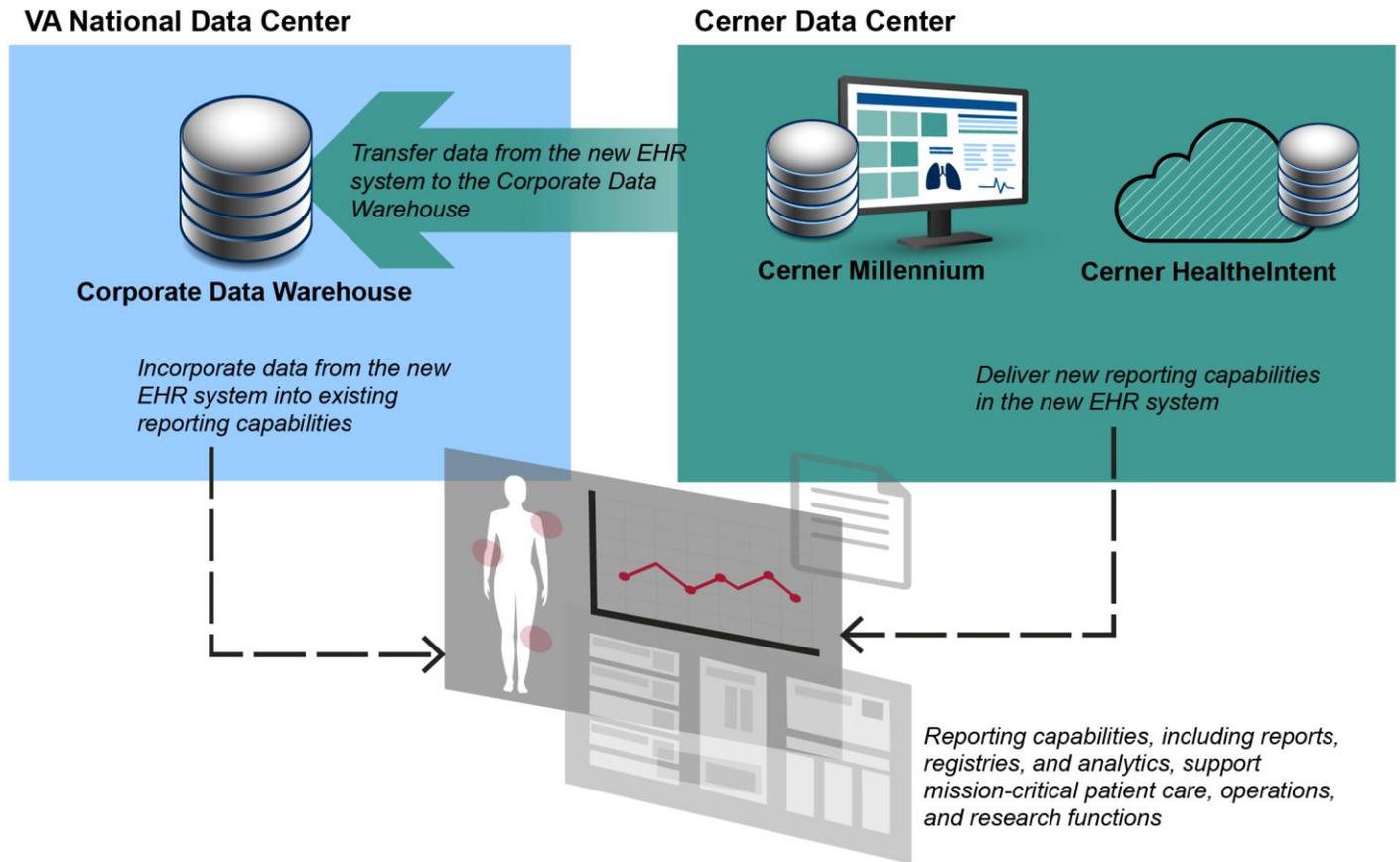
Figure 4 shows the two planned activities comprising VA's approach for supporting the continuity of reporting for EHRM.

⁴⁸Department of Veterans Affairs, *Data Syndication Plan* version 3.0 (Washington, D.C.: Mar. 2, 2020).

⁴⁹The EHRM performance work statement required Cerner to work with the EHRM Reporting and Registries workgroup to develop custom reports to meet VA-specific reporting needs prior to the initial system deployment. At the time of the initial system deployment, the number of required custom reporting capabilities was 316. According to an official from the EHRM Reports and Registries Workgroup, the number of required custom reporting capabilities fluctuated over time to reflect EHR council decisions. Reporting capabilities in the new EHR system also included selected Cerner commercially available capabilities.

⁵⁰As of November 2021, VA had identified an additional 108 new reporting capabilities for delivery in the new EHR system.

Figure 4: Department of Veterans Affairs (VA) Planned Activities for Supporting the Continuity of Reporting for the Electronic Health Records (EHR) Modernization



Source: GAO analysis of VA documentation; images: Feodora/stock.adobe.com. | GAO-22-103718

VA Did Not Use a Stakeholder Register to Help Identify and Engage All Relevant Stakeholders for Reporting Continuity

Guidance included in the Office of Management and Budget’s Federal Data Strategy and the Project Management Institute’s *PMBOK® Guide* highlight the importance of identifying and engaging stakeholders to determine their needs.⁵¹ According to the *PMBOK® Guide*, identifying and engaging stakeholders and effectively managing their project expectations and participation is critical to project success. Further,

⁵¹Office of Management and Budget, Memorandum M-19-18; Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition* (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute is a not-for-profit association that, among other things, provides standards for managing various aspects of projects, programs, and portfolios.

emerging practices for stakeholder management included in the *PMBOK® Guide* describe the importance of identifying all stakeholders and not just a limited set.

Toward this end, the *PMBOK® Guide* states that using a stakeholder register can help organizations identify all relevant stakeholders, foster appropriate engagement, and meet their needs and expectations. A stakeholder register contains information about identified stakeholders, including their project role, major requirements and expectations, potential for influencing project outcomes, and attitudes toward risk. A stakeholder register can also be used to inform and document stakeholder engagement activities such as communications.

VA took steps to identify and engage certain stakeholders in developing and implementing its plans for the continuity of reporting. According to the department's EHRM plans, these stakeholders included members of the EHR councils as well as subject matter experts from VHA organizations who manage existing reporting capabilities. For example, within the EHR council structure, the department established groups with an interest in reporting continuity, including the EHRM Reports and Registries Workgroup and the Research Subcouncil. In addition, VA's plans reflected EHR council decisions regarding the selection of new EHR system reporting capabilities required for the initial deployment as well as new EHR system data required to support existing reporting capabilities in the Corporate Data Warehouse.⁵²

Further, VA's Chief Data Officer remarked on the positive relationship between VHA and OEHRM regarding reporting and noted that operational requirements were being met. A VHA director with a role in supporting continuity of reporting added that OEHRM and Cerner had been responsive to their requests. According to OEHRM's then-Chief Medical Officer, the program initially prioritized clinicians' patient care and user experience needs. These priorities informed the program's stakeholder

⁵²According to VA's plans, subject matter experts were expected to prioritize which data domains were most urgently required for reporting capabilities. Examples of prioritized data domains are patient demographics, problems, orders, surgery, procedures, labs, vital signs, and allergies. This selected data comprised approximately 12 percent of available data in Millennium. As noted in training slides prepared by OEHRM regarding this effort, a significant percent of the data not selected for transfer is operational in nature and may not be of value for reporting.

identification and engagement activities with regard to continuity of reporting.

Nevertheless, the department did not use a stakeholder register as a tool to identify all relevant stakeholders and inform engagement activities. A subsequent VA analysis prepared following the initial system deployment revealed that the department's plans did not reflect broad stakeholder input from across VHA.⁵³ OEHRM's then-Chief Medical Officer acknowledged that the program should have conducted more stakeholder outreach. This official also stated certain relevant stakeholders should have been represented on the EHR councils, but were overlooked. For example, according to the official, OEHRM did not initially recognize the need to conduct official outreach to the Office of Academic Affiliations.⁵⁴ According to EHRM Reports and Registries progress reports, this office relies on reporting capabilities that use EHR data. A VA director involved with the department's research community expressed concern that stakeholders with an interest in the continuity of reporting for research were not appropriately involved in EHRM decisions. This official stated that OEHRM had not given full consideration to the value and role of research for EHRM.

A stakeholder register is intended to help identify and engage all relevant stakeholders. Until VA uses such a tool, the department risks overlooking EHRM stakeholder needs for reporting on patient care, operations, and research functions.

VA's Plans Described Expected Use of JLV During the New EHR System Deployment

VA's plans called for using JLV to fill gaps in the availability of health data as the department implements EHRM in addition to using JLV for its long-established purpose of providing clinicians with access to certain health data generated by DOD. Specifically, VA's EHRM plans called for using JLV to provide clinicians with access to their patients' health data,

⁵³The analysis stated that data selected for transfer from the new EHR system to the Corporate Data Warehouse excluded certain important data, such as military service separation dates.

⁵⁴According to the VHA Directive for the Office of Academic Affiliations, VHA operates the nation's largest education and training effort for health professionals. The Office of Academic Affiliations oversees the department's policies and programs for educating and training health professionals to enhance the quality of and timely access to care provided to veterans.

regardless of whether the data originated in the department's legacy or new EHR systems.

To support clinicians using the legacy system, VA's plans called for JLV to provide a read-only view of data created in the new system. JLV is necessary for this purpose because data created in the new system are not generally expected to be available in the legacy system.⁵⁵ As a result, if a patient visits a site where the new EHR system has already been deployed, the data associated with the visit will only be accessible to clinicians at sites using the legacy system via JLV.

To support clinicians using the new system, VA's plans called for JLV to provide a read-only view of any legacy EHR system data that have not been migrated. This is necessary because, as discussed earlier, the department initially migrated patient data from the legacy to the new EHR system for only selected data domains.⁵⁶ Without JLV, clinicians using the new system were not expected to have access to patient data from domains that were not yet migrated. For example, at the time of the initial system deployment, VA had yet to migrate electrocardiogram images and blood bank data.⁵⁷ As a result, clinicians using the new system were only able to access these data via JLV.

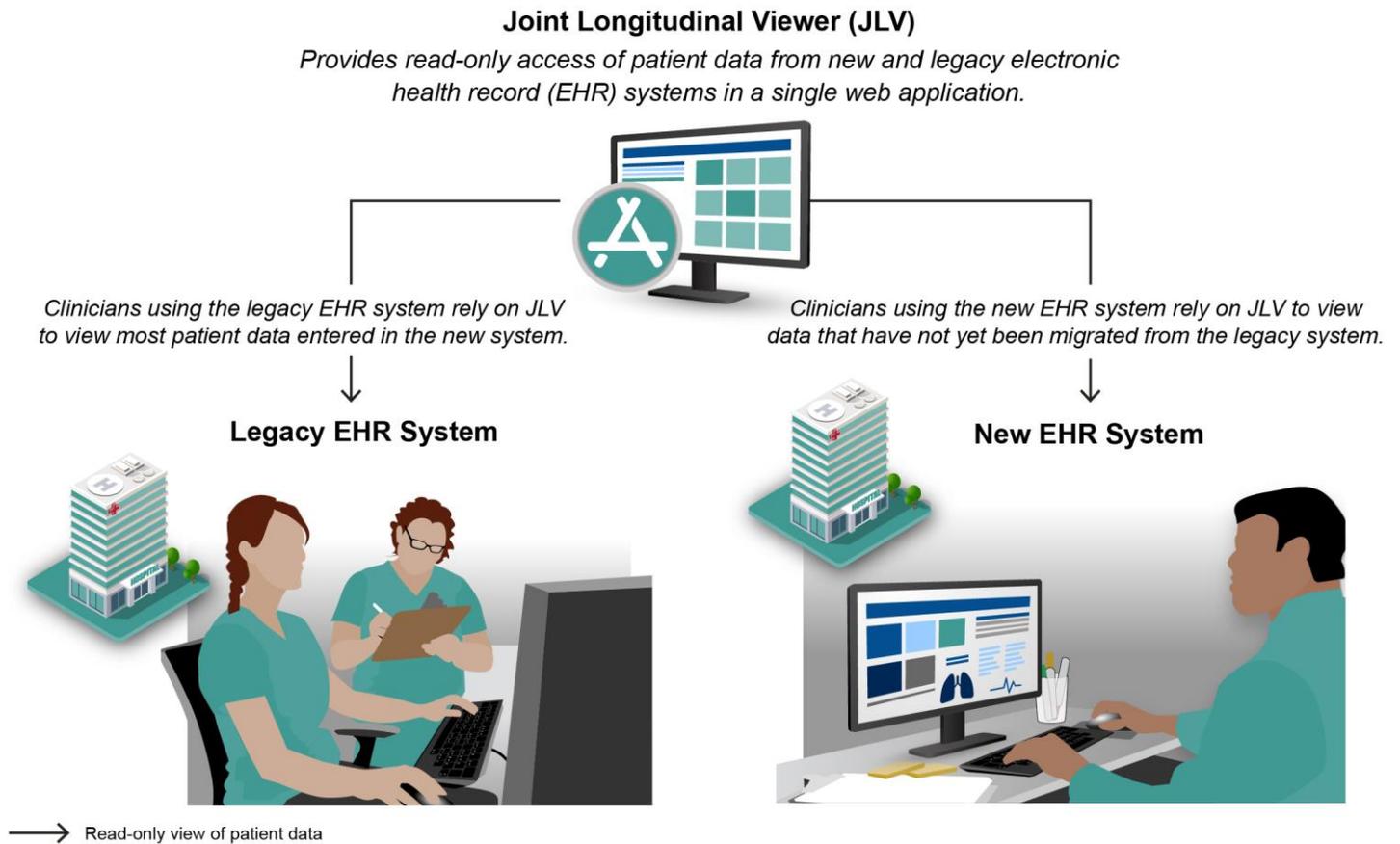
Figure 5 demonstrates how VA planned to use JLV to support clinicians using the legacy and new EHR systems.

⁵⁵According to the *OEHRM Data Migration Plan*, VA identified two special cases where patient data entered in the new EHR system should be transferred to the legacy EHR system to maintain the continuity of existing automated processes (medication orders and patient record flags). These data are used to alert clinicians to patient behavior or characteristics that may pose a threat to their safety.

⁵⁶For example, for the initial system deployment at the Mann-Grandstaff VA Medical Center, the department migrated active patient data from six data domains for selected periods of time and for entries determined to be most clinically relevant. Only those selected data were available for ongoing transfer to the new EHR system at the time of VA's initial system deployment.

⁵⁷According to VA's data migration plans, legacy EHR system patient data from these domains were expected to be migrated when VA deploys capability set 2.0 or later.

Figure 5: Planned Use of JLV at Department of Veterans Affairs (VA) Sites Using Legacy and New EHR Systems



Source: GAO analysis of VA documentation. | GAO-22-103718

The department has not yet determined whether JLV will remain necessary to provide clinicians with access to their patients' health data when the new system is fully deployed. According to the OEHRM Chief Technology and Integration Officer, VA initially expected the new system to eventually provide clinicians with access to their patients' complete health data, therefore, eliminating the need for JLV. However, the Chief Technology and Integration Officer also stated that the department plans to reassess whether the new EHR system has the ability to meet user needs currently fulfilled by JLV.⁵⁸

⁵⁸VA expected to conduct this assessment 2 years after the new system's initial deployment, which took place in October 2020.

VA Coordinated Data Management Activities with DOD Using Joint Processes and Decision-Making Groups

As noted earlier in this report, VA's and DOD's respective modernization efforts are intended to deliver a single, shared EHR system. As a result, VA has used a number of approaches to coordinate data management activities for the shared system with DOD. These approaches have included using joint processes and decision-making groups to coordinate EHRM data management activities between both departments.

Specifically, VA used the FEHRM Program Office's process to identify, evaluate, and reach consensus on a wide range of risks, issues, and opportunities, including those related to data management.⁵⁹ The program office documented this joint process for managing new risks, issues, and opportunities in a business rules document.⁶⁰ The document stated that FEHRM leadership is to conduct biweekly coordination meetings to discuss matters that require a formal decision, are new or high priority, or are being considered for closure. Further, representatives from OEHRM and DOD's EHRM program are to be included in coordination meetings and are responsible for submitting new risks, issues, and opportunities for consideration.

In addition, VA coordinated with DOD to consider and reach consensus on data management topics via a number of joint decision-making groups.⁶¹ Table 1 lists examples of the joint decision-making groups and their respective responsibilities.

⁵⁹As previously discussed, the FEHRM Program Office supersedes the Interagency Program Office as a single point of accountability for VA and DOD health care exchange efforts.

⁶⁰This process involved developing a comprehensive list of risks, issues, and opportunities and associated mitigation or action plans. According to the FEHRM Implementation Plan, joint decisions were previously managed separately across five technical and functional workgroups. When the FEHRM Program Office established the comprehensive Risk, Issues, and Opportunities list, it included the issues previously identified by the workgroups.

⁶¹These joint decision-making groups are intended to facilitate a range of joint decisions that may extend beyond data management. Depending on the decision at hand, any of these decision-making groups may facilitate decisions regarding data management.

Table 1: Examples of Department of Veterans Affairs (VA) and Department of Defense (DOD) Decision-Making Groups Involved in Data Management Coordination

Joint decision-making groups	Responsibilities
Joint Sustainment and Adoption Board	Reviewing, approving, and documenting content and configuration changes for the new EHR system.
Joint Functional Decision Group	Evaluating joint functional issues that affect the implementation and sustainment of the new EHR system.
Joint Data, Analytics, Reporting, and Registry Board	Evaluating and resolving data, analytics, reporting, and registry issues that affect the implementation and sustainment of HealthIntent and Millennium.
Federated Interagency Terminology Service	Managing and monitoring of terminology content for domains such as allergies and medications within clinical information systems VA and DOD jointly use.

Source: GAO analysis of VA documentation. | GAO-22-103718

VA also coordinated with DOD to establish workgroups that address EHR data management topics. In particular, under the leadership of the Joint Data, Analytics, Reporting, and Registry Board, representatives from VA and DOD established workgroups for jointly developing reporting capabilities, authorizing access to certain data, and identifying additional EHRM data requirements, among other things.

Using these joint processes and decision-making groups, VA and DOD identified and addressed a number of data management issues as the two departments have worked toward deploying a shared EHR system. For example, the departments recognized a need to reconcile their long-standing policies and practices for managing access to health data in their respective EHR systems.⁶²

Among the actions taken to address this issue, VA and DOD jointly developed guidance for granting access to health data in HealthIntent.⁶³ This guidance included requirements for access to health data in HealthIntent, such as training and background investigations, and established a process for reviewing access requests.⁶⁴ The departments

⁶²Department of Veterans Affairs and Department of Defense, *Memorandum for Record: Access and Restrictions to Information within the Joint Electronic Health Record of the Department of Veterans Affairs and Department of Defense* (Washington, D.C.: June 21, 2019).

⁶³Department of Veterans Affairs and Department of Defense, *Provisioning Roles and Access to HealthIntent* (Washington, D.C.: Oct. 21, 2019).

⁶⁴This guidance was prepared by the Joint Data, Analytics, Reporting, and Registry Board and approved by the Joint Functional Decision Group in November 2019.

also agreed to limit the transfer of certain servicemembers' health data from the shared EHR system to VA's Corporate Data Warehouse.

As another example of data management coordination, VA and DOD officials involved with the Joint Data, Analytics, Reporting, and Registry Board established a process for collaboratively delivering new reporting capabilities in the shared EHR system. This process was intended to increase standardization and ensure reporting capabilities in HealthIntent and Millennium reflect both departments' needs.

Further, VA coordinated data management activities for the shared system with DOD and the FEHRM Program Office by taking part in an effort to develop a joint VA-DOD data management plan for the new, shared EHR system. According to FEHRM officials, the data management plan is intended to align with a joint data and analytics strategy the Joint Executive Committee is developing.⁶⁵ The officials noted that they expect the plan to define a joint VA-DOD governance structure for EHR data management, including activities related to data quality. The plan is also expected to define a desired state for EHR data management, as well as key implementation activities and timelines for achieving the desired state.

Conclusions

Health data, such as those managed in VA's EHR system, are essential to VA's ability to deliver health care services to about 9 million veterans annually. Recognizing the importance of these data, the department incorporated data management activities into its planning for the modernization of its EHR system. However, the department did not ensure that the quality of data migrated prior to the initial system deployment met clinicians' needs for accessibility, accuracy, and appropriateness. This occurred, in part, because VA did not establish performance measures and goals that could have helped ensure the quality of migrated data and that could have helped assess whether clinicians' needs were met. Until VA ensures the quality of migrated data, the department will be challenged to objectively measure whether migrated data meet clinicians' needs in the new EHR system.

⁶⁵The Joint Executive Committee is a joint governance body comprised of VA and DOD leadership. According to the FEHRM Program Office, the Joint Executive Committee contracted with MITRE to develop a joint strategy for data and analytics, based on strategies developed by each department. MITRE is a non-governmental, not-for-profit entity with expertise in health information technology that operates multiple federally funded research and development centers and conducts work with VA to address the challenges of providing seamless, timely delivery of benefits and services to veterans.

VA's EHRM data management plans also reflected the importance of reporting capabilities that rely on health data to support the department's patient care, operations, and research functions. The department began to implement these plans and took steps to identify and engage stakeholders for reporting continuity. Apart from VA's stakeholder management efforts, the use of a stakeholder register could have helped identify and engage stakeholders who were overlooked. Until VA uses a register to help identify and engage all relevant stakeholders, it risks not meeting the reporting needs of certain EHRM stakeholders.

Recommendations for Executive Action

We are making two recommendations to VA:

The Secretary of VA should direct the Deputy Secretary to establish and use performance measures and goals to ensure that the quality of migrated data meets stakeholder needs for accessibility, accuracy, and appropriateness prior to future system deployments. (Recommendation 1)

The Secretary of VA should direct the Deputy Secretary to use a stakeholder register to improve the identification and engagement of all relevant EHRM stakeholders to address their reporting needs. (Recommendation 2)

Agency Comments

We provided a draft of this report to VA for review and comment. In its written comments, reproduced in appendix II, VA concurred with our recommendations and described steps that it planned to take to address them. Specifically, the department noted that it will establish and use performance measures and goals to ensure that the quality of migrated data meets stakeholder needs for accessibility, accuracy, and appropriateness prior to future system deployments. In addition, VA commented that it will apply lessons learned from EHRM deployments to improve data quality. The department also stated that it will use a stakeholder register to improve the identification and engagement of all relevant EHRM stakeholders and address their reporting needs. Further, VA provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees and the Secretary of VA. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staffs have any questions on the matters discussed in this report, please contact me at (202) 512-4456 or at harriscc@gao.gov. Contact points for our Offices of Congressional Relations and Public

Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

A handwritten signature in black ink, appearing to read "C. Harris", with a long horizontal flourish extending to the right.

Carol C. Harris
Director, Information Technology and Cybersecurity Issues

List of Requesters

The Honorable Jon Tester
Chairman
The Honorable Jerry Moran
Ranking Member
Committee on Veterans' Affairs
United States Senate

The Honorable Frank Mrvan
Chairman
The Honorable Matthew Rosendale, Sr.
Ranking Member
Subcommittee on Technology Modernization
Committee on Veterans' Affairs
House of Representatives

The Honorable Jim Banks
House of Representatives

The Honorable Susie Lee
House of Representatives

Appendix I: Objectives, Scope, and Methodology

Our objectives were to:

1. Describe the Department of Veterans Affairs' (VA) plans for migrating data to the new electronic health record (EHR) system and determine the extent to which the department has implemented those plans.
2. Describe VA's plans for EHR modernization (EHRM) continuity of reporting and determine the extent to which the department has implemented those plans.
3. Describe the expected use of Joint Longitudinal Viewer (JLV) defined in VA's data management plans.
4. Describe how VA coordinated its EHRM data management activities with the Department of Defense (DOD).

To describe the plans that VA developed to migrate data to the new EHR system and the extent to which the department has implemented those plans, we first obtained and reviewed EHR modernization program documentation. Specifically, we reviewed data migration plans prepared by the EHRM program office; the Office of Electronic Health Modernization (OEHRM); and the contractor responsible for providing, hosting, and deploying the new EHR system—Cerner Government Services, Inc. (Cerner).¹ The plans included OEHRM's Data Migration Plan and Architecture and Design Plan and the following plans prepared by Cerner: Data Migration Plan, Data Migration Detailed Requirements Document, Data Management Plan, and EHRM Master Test Plan. We also reviewed EHRM performance work statements and presentation slides, such as the EHRM program baseline, data migration overview, and national workshop slides.²

We used information in the plans and related documentation to describe data selected for migration and the importance of ensuring data quality, as well as VA's planned activities for migrating selected data to the new EHR system prior to the initial system deployment at the Mann-Grandstaff VA Medical Center.

¹Hosting refers to providing a data center for the new EHR system.

²National workshops were integrated sessions during which VA and Cerner iteratively designed, built, and validated the configuration of the EHR system. At these workshops, VA's EHR councils, comprised of VA clinicians, staff, and other experts in various clinical areas, decided how to design the functionality of the EHR software to help clinicians and other staff deliver care and complete tasks such as administering medication.

We then examined documentation regarding the results of the initial system deployment, including the quality of migrated data, and compared them to VA's plans. Specifically, we examined trouble tickets,³ test findings, progress reports for data migration prepared by OEHRM and Cerner, and analyses prepared by VA following the initial system deployment.

In addition, we identified applicable data management guidance and performance measurement practices for VA's EHRM data migration.⁴ Specifically, the Office of Management and Budget's Federal Data Strategy calls for agencies to protect data quality and validate that data are accessible, appropriate, and accurate, among other things.⁵ Further, generally recognized practices identified by the Project Management Institute and in our previous work,⁶ and highlighted in federal law, stress the importance of establishing performance measures and goals to

³Trouble tickets are requests for assistance submitted to the Cerner help desk.

⁴Performance measurement is the ongoing monitoring and reporting of program accomplishments toward pre-established goals, for any activity, project, function, or policy that has an identifiable purpose of set of objectives. Performance measures include those that address the results of program products and services (outcomes). GAO, *Performance Measurement and Evaluation: Definitions and Relationships (Supersedes GAO-05-739SP)*, [GAO-11-646SP](#) (Washington, D.C.: May 2, 2011).

⁵Office of Management and Budget, *Federal Data Strategy – A Framework for Consistency*, Memorandum M-19-18 (Washington, D.C.: June 4, 2019). The Federal Data Strategy is a framework of operational principles and best practices that are intended to enable government to fully leverage data as a strategic asset. Among other things, the strategy outlines principles that are intended to guide federal data management activities and inform agencies in developing and executing all aspects of the data lifecycle.

⁶Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition* (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute is a not-for-profit association that, among other things, provides standards for managing various aspects of projects, programs, and portfolios.

assess the actual results of a program or activity.⁷ To assess whether VA's data migration was consistent with the identified performance measurement guidance, we reviewed the department's data migration plans and the EHRM key performance indicators and value realization strategy.

To further inform our review of the department's data migration plans and implementation, we interviewed cognizant VA officials. Specifically, we interviewed OEHRM officials, such as the Chief Technology and Integration Officer, Chief Medical Officer, and Director for Test and Evaluation. These discussions informed our understanding of VA's progress toward planned data migration activities as well as plans for addressing challenges with the quality of migrated data. In addition, to obtain system users' perspectives on the quality of migrated data, we interviewed clinicians from the initial deployment site.

To describe the plans that VA developed to support the continuity of reporting for EHRM and the extent to which VA implemented those plans, we first obtained and reviewed EHRM program documentation prepared

⁷The Government Performance and Results Act of 1993, as amended by the Government Performance and Results Modernization Act of 2010, established a framework for federal government and agency performance plans, performance measurement, reporting, and federal government outcome-oriented priority goals. These requirements are applicable at the department or agency level or to certain agency activities described in the law. However, practices regarding performance measures and goals are important management tools applicable to all levels of an agency, including the program, project, or activity level, consistent with leading management practices and internal controls related to performance monitoring. We have previously reported that performance measurement allows organizations to track progress in achieving their goals and gives managers crucial information to identify gaps in program performance and plan any needed improvements. In addition, according to *Standards for Internal Control in the Federal Government*, managers should design activities to achieve objectives and respond to risks by, for example, comparing actual performance to planned or expected results and analyzing significant differences. The GPRA Modernization Act of 2010, 5 U.S.C. § 306, 31 U.S.C. §§ 1115-1116 & 1120-1124; GAO, *VA Medical Centers: VA Should Establish Goals and Measures to Enable Improved Oversight of Facilities' Conditions*, [GAO-19-21](#) (Washington, D.C.: Nov. 13, 2018); *Digital Service Programs: Assessing Results and Coordinating with Chief Information Officers Can Improve Delivery of Federal Projects*, [GAO-16-602](#) (Washington, D.C.: Aug. 15, 2016); *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014); *DHS Training: Improved Documentation, Resource Tracking, and Performance Measurement Could Strengthen Efforts*, [GAO-14-688](#) (Washington, D.C.: Sept. 10, 2014); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

by OEHRM, Cerner, and the EHRM Reports and Registries Workgroup.⁸ Specifically, we reviewed performance work statements, the OEHRM Data Syndication Plan,⁹ EHRM Reports and Registries Workgroup requirements documents, and Cerner contract deliverables that described VA's approach for continuity of reporting.¹⁰

We used information in the plans and related documentation to describe VA's approach for continuity of reporting. We then examined documentation regarding the results of the initial system deployment and compared them to the activities identified in VA's plans. Specifically, we examined progress reports prepared by Cerner, OEHRM, and the EHRM Reports and Registries Workgroup.

Further, we identified applicable guidance for VA's continuity of reporting activities regarding stakeholder management. Specifically, the Office of Management and Budget's Federal Data Strategy calls for agencies to identify and engage stakeholders throughout the data lifecycle to identify stakeholder needs.¹¹ In addition, according to the Project Management Institute, identifying and engaging all relevant stakeholders in an appropriate way is critical to project success.¹²

We compared VA's continuity of reporting efforts to the applicable guidance. Specifically, to assess whether VA identified and engaged

⁸VA established 18 EHR councils comprised of VHA clinicians, staff, and other subject matter experts to coordinate with Cerner and provide input regarding data and reporting capabilities for EHRM, among other things. The EHRM Reports and Registries Workgroup is part of this EHR council structure and falls under the Quality, Safety, and Value Council.

⁹In the context of EHRM, data syndication refers to the process by which data is aggregated and transferred from Cerner's environment to VA's Corporate Data Warehouse.

¹⁰Plans prepared by Cerner include the following contract deliverables: Detailed Registry Migration Plan, Requirements and Timeline Document, Detailed Health Registry Migration Plan, Requirements and Timeline Document, Commercially Available Reports, and Report Requirements Definition Documentation.

¹¹Office of Management and Budget, Memorandum M-19-18. The Federal Data Strategy outlines practices that can guide agencies in leveraging the value of data. This includes practices that reflect the importance of aligning data management with data usage in order to answer critical federal government questions and meet stakeholder needs.

¹²Project Management Institute, Inc., *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition* (2017). PMBOK is a trademark of Project Management Institute, Inc. The Project Management Institute is a not-for-profit association that, among other things, provides standards for managing various aspects of projects, programs, and portfolios.

stakeholders in a manner consistent with guidance from the Office of Management and Budget and Project Management Institute, we reviewed EHRM program documentation discussed earlier, as well as analyses prepared by VA following the initial system deployment.

To further inform our review of VA's plans and progress for the continuity of reporting, we interviewed cognizant VA officials, including the OEHRM Chief Technology and Integration Officer and Chief Medical Officer, as well as officials from the Veterans Health Administration. In addition, to obtain context and further our understanding of VA's efforts to support the continuity of reporting, we observed weekly meetings of the Joint Data, Analytics, Reporting, and Registry Board from May 2020 through August 2021. We also observed presentations for internal stakeholders conducted by knowledgeable OEHRM officials from December 2019 through May 2021.

To describe the expected use of JLV defined in VA's data management plans, we obtained and reviewed EHRM documentation. Specifically, we examined OEHRM's Data Migration Plan and Architecture and Design Plan, and well as an OEHRM presentation on capabilities and workflows for the new EHR system. We also reviewed the JLV user guide and related documents to understand how JLV provides clinicians with access to their patients' health data. We supplemented our analysis with information obtained through interviews with knowledgeable officials, such as the OEHRM Technology and Integration Officer and Chief Medical Officer, and the Federal Electronic Health Record (FEHRM) Program Office Director.

To describe how VA coordinated its EHRM data management activities with DOD, we obtained and reviewed documentation prepared by the FEHRM Program Office and VA-DOD joint decision-making groups for EHRM that were chartered or expected to be chartered under that office. Specifically, we reviewed the following documents prepared by the program office: FEHRM Charter and Implementation Plan; business rules for managing joint risks, issues, and opportunities; and information regarding the development of a joint data management plan.

In addition, we reviewed charters for the Joint Functional Decision Group; Federated Interagency Terminology Service; and Joint Sustainment and Adoption Board; as well as a decision documentation and tracking document for the Joint Data, Analytics, Reporting, and Registry Board. We also observed weekly meetings of the Joint Data, Analytics, Reporting, and Registry Board from May 2020 through August 2021,

which informed our understanding of VA's role in this joint decision-making group and associated workgroups.

Further, to describe examples of the types of data management activities for which VA has coordinated with DOD, we examined joint decision memoranda and related documentation prepared by or presented to the FEHRM Program Office. We supplemented our analysis with information obtained through interviews with knowledgeable officials from OEHRM; the Joint Data, Analytics, Reporting, and Registry Board; and the FEHRM program office.

We also assessed the reliability of computer-processed data supporting our review. Specifically, we assessed the reliability of the following data sources: EHRM program test findings, risk and issues registers, a trouble ticket report extract, data migration progress reports, and EHRM Reports and Registries Workgroup progress reports. To assess the reliability of these data, we (1) analyzed related documentation and (2) interviewed knowledgeable officials about the quality control procedures used by the program to assure accuracy and completeness of the data. For the EHRM Reports and Registries Workgroup progress reports, we also examined the data for obvious outliers, incomplete entries, or unusual entries.

As a result of this assessment, we determined that the data from these sources were sufficiently reliable for our reporting purposes. Specifically,

- Data included in the OEHRM test findings were sufficiently reliable for summarizing the nature of VA's test activities.
- Data included in OEHRM risks and issues registers were sufficiently reliable for summarizing information about risks and issues pertaining to migrating data and supporting the continuity of reporting for EHRM.
- Relevant data in the trouble ticket extract were sufficiently reliable for summarizing examples of trouble tickets that corroborated data migration quality challenges discussed in VA's post-deployment analyses and Cerner progress reports.
- Data included in the OEHRM data migration progress reports were sufficiently reliable for describing the department's planned data migration activities and their completion status at specific points in time.

- Data included in the EHRM Reports and Registries Workgroup progress reports were sufficiently reliable for reporting the number of planned and completed reporting capabilities at specific points in time.

We conducted this performance audit from August 2019 to February 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the Department of Veterans Affairs



DEPARTMENT OF VETERANS AFFAIRS
WASHINGTON

January 14, 2022

Ms. Carol C. Harris
Director
Information Technology and Cybersecurity Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Harris:

The Department of Veterans Affairs (VA) has reviewed the Government Accountability Office (GAO) draft report: ***ELECTRONIC HEALTH RECORDS: VA Needs to Address Data Management Challenges for New System*** (GAO-22-103718).

The enclosure contains general and technical comments and the actions to be taken to address the draft report recommendations. VA appreciates the opportunity to comment on your draft report.

Sincerely,

A handwritten signature in blue ink that reads "Tanya J. Bradsher".

Tanya J. Bradsher
Chief of Staff

Enclosure

Enclosure

Department of Veterans Affairs (VA) Comments to
Government Accountability Office (GAO) Draft Report
***Electronic Health Records: VA Needs to Address Data Management
Challenges for New System***
(GAO-22-103718)

Recommendation 1: The Secretary of VA should direct the Deputy Secretary to establish and use performance measures and goals to ensure that the quality of migrated data meets stakeholder needs for accessibility, accuracy, and appropriateness prior to future system deployments.

VA Response: Concur. The Electronic Health Record Modernization (EHRM) Integration Office will establish and use performance measures and goals aligned with and integrated into the VA Data Strategy to ensure that the quality of migrated data meets stakeholder needs for accessibility, accuracy and appropriateness prior to future system deployments. This aspect of EHRM will meet enterprise data quality and reliability standards.

Target Completion Date: March 2022

Recommendation 2: The Secretary of VA should direct the Deputy Secretary to use a stakeholder register to improve the identification and engagement of all relevant EHRM stakeholders and address their reporting needs.

VA Response: Concur. The EHRM Integration Office will use a stakeholder register to improve the identification and engagement of all relevant EHRM stakeholders and address their reporting needs.

Target Completion Date: March 2022

**Appendix II: Comments from the Department
of Veterans Affairs**

Enclosure

Department of Veterans Affairs (VA) Comments to
Government Accountability Office (GAO) Draft Report
***Electronic Health Records: VA Needs to Address Data Management
Challenges for New System***
(GAO-22-103718)

General Comments:

VA's EHRM program has migrated more legacy data than any of Cerner's commercial customers, both in terms of data domains (21) and total volume (more than 223 billion records). Clinical data experts from the Veterans Health Administration (VHA) and Cerner performed significant analyses on the legacy data in preparation for migration to HealthIntent and Millennium. These analyses ensured that VA received cleaner, more standardized data than it has utilized in the past and even led to recommendations for improving data in legacy VistA systems. Additionally, data migration improvements to the Vx130 platform, which provides VistA data to EHRM, also served to improve VistA data delivery to the Corporate Data Warehouse (CDW).

Any data that are in VistA can be easily extracted, packaged and sent to Cerner. The entire path is automated. Database models are preferred, but if one is not available, it will be generated from VistA data dictionaries and metadata. The data migration team regularly adds fields that are requested by various domain experts. The team monitors VistA for changes and patches and regenerates extraction code as needed to keep data flowing. These activities are performed in concert with Cerner, who must accept the VistA data and then perform patient matching, deduplication and transformation as necessary to match the Cerner environment and migrate the data into the Millennium system. Data are constantly checked by the testing and evaluation team for quality and work is ongoing to make that process more efficient.

As mentioned in the report, over 80% of the 1,206 critical enterprise reports and registries defined by VHA are now incorporating EHRM data. In addition, other VA systems that depend on CDW for data are also incorporating EHRM data. Updated systems include:

- Stratification Tool for Opioid Risk Management – Improves opioid safety;
- ReachVet – Identifies elevated risk for suicide and other adverse outcomes;
- VSignals Outpatient Surveys – Provides feedback for process improvement; and
- VASQIP – Surgical mortality tracking for surgical quality improvement.

Since go-live at Mann-Grandstaff VA Medical Center in Spokane, Washington, several dozen data management improvements have been implemented in the production system, to include VHA and Cerner pharmacy and terminologist efforts to improve the validation of medication mappings and the automation of domains such as consult orders, lab orders, radiology orders, insurance information, appointments and active medications.

Page 2 of 4

**Appendix II: Comments from the Department
of Veterans Affairs**

Enclosure

Department of Veterans Affairs (VA) Comments to
Government Accountability Office (GAO) Draft Report
***Electronic Health Records: VA Needs to Address Data Management
Challenges for New System***
(GAO-22-103718)

The EHRM program will continue to introduce similar improvements for the next go-live. Additional automation will reduce manual effort and improve data accuracy, and the Seamless Exchange capability will improve the incorporation of partner and legacy data by posting bulk data uploads into the record. This will not only reduce the administrative burden on clinicians but will also be a significant advancement for both data migration and interoperability.

VA will continue to apply lessons learned from the EHRM deployments to improve the accessibility, accuracy and availability of data from legacy VA and Department of Defense systems and from community care partners.

Page 3 of 4

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Carol C. Harris (202) 512-4456 or harriscc@gao.gov

Staff Acknowledgments

In addition to the individual named above, the following staff made key contributions to this report: Mark Bird (Assistant Director), Jacqueline Mai (Analyst in Charge), Gerard Aflague, Alexander Bennett, David Blanding, Hannah Brookhart, Kisa Bushyeager, Christopher Businsky, Rebecca Eyley, Ashley Mattson, Monica Perez-Nelson, Scott Pettis, Daniel Spence, Walter Vance, and Adam Vodraska.

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