



June 2020

ELECTRONIC HEALTH RECORDS

Ongoing Stakeholder Involvement Needed in the Department of Veterans Affairs' Modernization Effort

Why GAO Did This Study

VA's existing EHR system is antiquated, costly to maintain, and does not fully support VA's need to exchange health records with other organizations, such as the Department of Defense. As a result, VA has undertaken a modernization effort to replace it. As VA prepares to transition from its existing EHR system to a commercial system, it has the opportunity to design standardized work processes to support the delivery of care and ensure information on veterans' care is consistently captured, regardless of site of care.

GAO was asked to review VA's EHR system configuration process. This report examines, among other objectives: (1) how VA made EHR system configuration decisions and assessed the compatibility of the commercial EHR system with its work processes; and (2) the effectiveness of VA's decision-making procedures, including ensuring key stakeholder involvement.

GAO observed national and local workshop meetings; visited planned initial implementation sites; reviewed documentation on the processes and schedule; and interviewed VA, DOD, and contractor officials.

What GAO Recommends

GAO is recommending that VA ensure the involvement of all relevant medical facility stakeholders in the EHR system configuration decision process. VA concurred with GAO's recommendation.

View [GAO-20-473](#). For more information, contact Debra A. Draper, 202-512-7114 or DraperD@gao.gov or Carol C. Harris at 202-512-4456 or HarrisCC@gao.gov

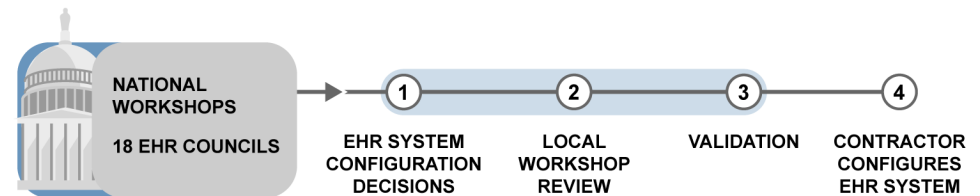
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What GAO Found

The Department of Veterans Affairs (VA) used a multi-step process to help ensure that its future commercial electronic health record (EHR) system is configured appropriately for, and is compatible with, its clinical work processes. To configure the EHR system, which VA planned to implement initially at the Mann-Grandstaff VA Medical Center, in Spokane, Washington, in July 2020, and at the Puget Sound Health Care System in the fall of 2020, VA established 18 EHR councils comprising VA clinicians, staff, and other experts in various clinical areas and held eight national workshops between November 2018 and October 2019. At these workshops, the councils 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. VA also held eight local workshops at both medical centers to help ensure that the EHR configuration supported local practices. As of March 2020, the EHR councils were continuing to meet to complete configuration decisions. Furthermore, VA plans to hold local workshops in advance of the EHR system implementation at future VA medical facilities. In April 2020, the VA Secretary announced that the department had shifted priorities to focus on caring for veterans in response to the pandemic created by COVID-19. According to program officials, at that time, they paused the implementation of the EHR system and were assessing the impact of the COVID-19 pandemic on VA's planned implementation schedule.

Electronic Health Record (EHR) System Configuration Decision Process



Source: Department of Veterans Affairs. | GAO-20-473

GAO found that VA's decision-making procedures were generally effective as demonstrated by adherence to applicable federal internal control standards for establishing structure, responsibility, and authority, and communicating internally and externally, but that VA did not always ensure key stakeholder involvement. Specifically, the councils included a wide range of stakeholders from various geographic regions. However, according to clinicians from the two initial medical facilities for implementation, VA did not always effectively communicate information to stakeholders, including medical facility clinicians and staff to ensure relevant representation at local workshop meetings. As a result, local workshops did not always include all relevant stakeholders. VA has not indicated how it plans to describe these future sessions and define key terms to ensure key stakeholder participation in local workshops. By ensuring that all relevant stakeholders are included, VA will increase the likelihood that it is obtaining input from a wide range of clinicians and staff who will use the EHR system and will increase the likelihood that when it is implemented, the EHR system will effectively support the delivery of care at VA medical centers.

Contents

Letter		1
	Background	6
	VA Used a Multi-Step Process to Make EHR Configuration Decisions and Assess System Compatibility	10
	VA Met Its Schedule for Making Initial EHR System Configuration Decisions, and Has Formulated a Schedule for Remaining Efforts	18
	VA's Decision-Making Procedures Were Generally Effective, but Key Stakeholders Were Not Always Included	21
	Conclusions	29
	Recommendation for Executive Action	29
	Agency Comments	29
Appendix I	Status of Electronic Health Record System Configuration Decisions, as of November 2019 and March 2020	31
Appendix II	Comments from the Department of Veterans Affairs	36
Appendix III	GAO Contact and Staff Acknowledgments	39
Tables		
	Table 1: Workflow Development by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 13, 2019 and March 26, 2020	32
	Table 2: Design Decision Matrices Developed by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 13, 2019 and March 26, 2020	33
	Table 3: Percentages of Data Collection Workbooks Developed by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 1, 2019 and March 26, 2020	34

Figures

Figure 1: Simplified Example of a Workflow for Medication Administration	12
Figure 2: Example Design Decision Matrix for Medication Administration	13
Figure 3: Example Data Collection Workbook for Medication Administration	14
Figure 4: Department of Veterans Affairs (VA) Electronic Health Record (EHR) Council Process for Making EHR System Configuration Decisions	17
Figure 5: Department of Veterans Affairs (VA) Electronic Health Record Modernization (EHRM) Program Decision-Making Procedures	23

Abbreviations

Cerner	Cerner Government Services, Inc.
COVID-19	Coronavirus Disease 2019
DOD	Department of Defense
EHR	electronic health record
EHRM	Electronic Health Record Modernization
MHS Genesis	Military Health System Genesis
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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June 5, 2020

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

The Honorable Susie Lee
Chair
The Honorable Jim Banks
Ranking Member
Subcommittee on Technology Modernization
Committee on Veterans' Affairs
House of Representatives

The Honorable Conor Lamb
House of Representatives

Within the Department of Veterans Affairs (VA), the Veterans Health Administration (VHA) operates one of the nation's largest health care systems, serving more than 6 million patients annually. VA relies on its electronic health record (EHR) system—the Veterans Health Information Systems and Technology Architecture (VistA)—to document the delivery of health care services to veterans.¹ However, in our prior work, we have found this technically complex system, which has been in operation for more than 30 years, is costly to maintain and does not fully support VA's need to electronically exchange health records with other organizations, such as the Department of Defense (DOD) and private health care providers.² Moreover, customization of the system by VA medical facilities

¹An EHR is a collection of information about the health of an individual and the care provided that individual, such as patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports.

²See for example GAO, *Electronic Health Records: VA Needs to Identify and Report System Costs*, [GAO-19-125](#) (Washington, D.C.: July 25, 2019). Over the last several decades, VistA has evolved into a technically complex system that supports health care delivery at more than 1,500 VA facilities, including VA medical centers, outpatient clinics, community living centers, and VA vet (readjustment counseling) centers.

has resulted in approximately 130 versions of VistA across the VA health care system, raising questions about the consistency of the information collected, among other issues. As such, the department has undertaken a modernization effort to replace VistA with a commercial EHR system, developed by Cerner Government Services, Inc., (Cerner)—a configuration of the same system DOD is implementing.³

Before VA transitions from VistA to the commercial EHR system, the department has to make design configuration decisions—such as, determining all the data that need to be incorporated into the EHR system. Such data configuration decisions would enable the system to support the work processes that VA clinicians and staff follow in delivering care. Furthermore, the department has to assess the compatibility of the EHR system with the processes clinicians and staff use to deliver care. VA expects to implement the new EHR system initially at two medical centers in 2020 before implementing it across VA. With the new system, VA has the opportunity to reduce clinical and procedural variations, both between VA and DOD, and across the VA health care system’s more than 1,500 medical facilities.⁴ Such variations can cause challenges, including ensuring information on veterans’ care is documented consistently.

You asked us to review the VA’s Electronic Health Record Modernization (EHRM) program’s process towards making decisions for configuring the new EHR system. In this report, we focus on VA’s ongoing efforts to implement its new EHR system at the two medical centers. Specifically, we

1. describe how VA made EHR system configuration decisions and assessed the compatibility of the Cerner EHR system with the work processes that medical facilities follow,

³Cerner is a health care information technology company based in Kansas City, Missouri that provides clinical solutions, services, devices, and hardware. VA’s refers to its configuration of the Cerner EHR system as Cerner Millennium, whereas DOD refers to its configuration of the system as Military Health System (MHS) Genesis.

⁴EHRs are particularly crucial for optimizing the health care provided to veterans and military personnel. While in active military status and later as veterans, many DOD and VA beneficiaries, along with their family members, tend to be highly mobile and may have health records residing at multiple medical facilities within and outside the United States.

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2. evaluate the extent to which VA met its schedule for making EHR system configuration decisions, and
 3. assess the effectiveness of VA's system configuration decision-making procedures, including the extent to which VA ensured that key stakeholders are involved.

To address the first objective, we reviewed available documentation on the process VA developed to make EHR system configuration decisions, which included establishing 18 EHR councils responsible for developing clinical workflows, design decision matrices, and data collection workbooks.⁵ As part of this review, we examined how configuration decisions may vary between VA medical facilities. We also reviewed assessments performed by VA's EHR councils to determine the compatibility of the commercial EHR system with the work processes VA medical facilities follow and efforts to address any incompatibilities.

To address the second objective, we assessed VA's EHR councils' progress in meeting the EHRM program's schedule for making EHR system configuration decisions. To do this, we reviewed available data and monthly reports from Cerner's tracking system on the EHR councils' progress in making these decisions. Specifically, we reviewed data on the workflows, design decision matrices, and data collection workbooks that the councils developed. We also compared that information to the EHRM program's documented schedule. To assess the reliability of these data, we reviewed the data to determine its completeness and identified causes for any deviations from the program's schedule. In addition, we interviewed officials responsible for entering and reviewing the data about their accuracy and reliability. We also compared summary reports to data extracts on completed workflows and design decision matrices. Based on these steps, we determined that the data were sufficiently reliable for the purposes of our reporting objective. Our scope focused on examining VA's progress in meeting its schedule for making EHR system configuration decisions. Therefore, we did not examine Cerner's progress towards the actual configuration of the system or implementation of it.

⁵Workflows are "process maps" designed to capture the start-to-finish sequence and interactions of related steps, activities, and tasks for each work process. Design decision matrices are compilations of decisions and discussion topics to address and support implementation of the EHR system. Data collection workbooks are intended to capture all the data that need to be incorporated into the EHR system.

To address the third objective, we reviewed documentation on VA EHR council member roles and responsibilities and procedures to identify the councils' organization and governance structures for decision-making and dispute resolution.⁶ Since VA is using the same commercial system as DOD, we also reviewed VA's procedures for coordinating with DOD on the implementation of its version of the Cerner commercial EHR system, known as Military Health System (MHS) Genesis. Furthermore, we reviewed the procedures that VA used to select EHR council members to ensure broad and relevant representation. To do this, we obtained a list of EHR council participants—including chairs, members, and consultants—and analyzed the data to determine the geographic region participants represented and the extent to which they represented VA's central office, Veterans Integrated Service Networks (VISN), or VA medical facilities (including the complexity level of these medical facilities).⁷ We assessed the reliability of data on EHR council participants through electronic testing for missing or duplicate data, and obvious errors, and noted any limitations found, accordingly.⁸ Lastly, we assessed the effectiveness of VA's decision-making procedures by comparing these procedures to applicable standards for internal control in the federal government for establishing structure, responsibility, and authority, and communicating internally and externally. We also assessed VA's procedures against leading collaboration practices as defined in GAO's collaboration criteria.⁹

To further inform our work on all three objectives we observed three VA national EHR council workshop meetings held during the period of our

⁶These documents included charters for VA's EHR Council, Functional Governance Board, and Governance Integration Board, as well as meeting minutes from VA's Functional Governance Board from June 2018 to January 2020.

⁷Each of VA's 18 regional VISNs is responsible for managing the medical facilities within its region. VHA categorizes VA medical facilities according to complexity level. The level is determined based on the characteristics of the patient population served, clinical services offered, educational and research missions, and administrative complexity. VA classifies medical facilities into three levels, the most complex medical facilities as Level 1, and the least complex as Level 3.

⁸For example, VA data on whether council participants represented the field or VA's central office was unknown or not reported for about 2 percent of participants. We note the number and percent of participants for which data is unknown.

⁹See GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014) and *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012). We applied criteria relevant to our objective, which was to assess decision-making procedures and ensure that key stakeholders are involved.

review, as well as two corresponding local workshop meetings for the first two VA medical facilities where VA plans to implement the commercial EHR system (Mann-Grandstaff VA Medical Center in Spokane, Washington, and VA Puget Sound Health Care System—American Lake, Washington and Seattle, Washington divisions).¹⁰ In addition, we interviewed cognizant officials from VA, DOD, and Cerner.¹¹ We also selected and contacted Veterans Service Organizations to obtain their perspectives on the EHRM program and VA's efforts to make system configuration decisions. We selected organizations that we had identified in our prior work related to VA's electronic health record system. This resulted in the selection of eight organizations for inclusion in our review.¹² The information we obtained from participants in the workshop meetings, officials from the first two medical facilities, and the Veterans Service Organizations is not generalizable.

We conducted this performance audit from May 2019 through June 2020 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.

¹⁰National workshops are integrated sessions during which VA and Cerner iteratively design, build, and validate the configuration of the EHR system. Local workshops generally follow the topics and structure of the national workshops, but are tailored to local VA facilities.

¹¹We met with officials from VA's EHRM program office, facility leadership from the first two medical facilities, participants from national and local workshops, and leadership from the DOD and VA Federal Electronic Health Record Modernization Program Office, among others.

¹²Veterans Service Organizations provide a wide range of services for veterans and their dependents, such as assistance obtaining health care and benefits. The eight Veterans Service Organizations we contacted for this review included: (1) the American Legion, (2) AMVETS, (3) Disabled American Veterans, (4) Iraq and Afghanistan Veterans of America, (5) Military Officers Association of America, (6) Paralyzed Veterans of America, (7) Veterans of Foreign Wars, and (8) Vietnam Veterans of America.

Background

VHA manages one of the largest health care delivery systems in the United States and is responsible for overseeing the provision of health care at VA medical facilities. VA relies on its EHR system—VistA—to document the delivery of health care services to veterans.

VA's VistA EHR System

To facilitate care, clinical providers access patient medical records and document the care they provide in EHR systems. Patient information needs to be accessible and consistent to prevent risks to patients' safety, particularly when shared between providers. Information that is electronically exchanged from one provider to another must adhere to the same standards to be consistently interpreted and used in EHRs. In our prior work, we found that EHR technology has the potential to improve the quality of care that patients receive and to reduce health care costs.¹³

VistA has served as VA's EHR system for more than 30 years. Over the last several decades, it has evolved into a technically complex system that comprises about 170 modules that support health care delivery at more than 1,500 medical facilities.¹⁴ In addition, customization of VistA, such as changes to the modules by the various medical facilities, has resulted in approximately 130 versions of the system VA-wide. Furthermore, as we have reported, VistA is costly to maintain and does not fully support VA's need to electronically exchange health records with other organizations, such as DOD and community providers.¹⁵

VA and DOD have historically operated separate EHR systems. In addition to patient data from its own EHR system, VA relies on patient data from DOD to help ensure that it has access to the necessary health information that could assist clinicians in making informed decisions to

¹³See *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).

¹⁴VistA products or modules can also be composed of one or more software applications that support health care functions, such as providing care coordination and mental health services.

¹⁵See *GAO, VA IT Modernization: Preparations for Transitioning to a New Electronic Health Record System Are Ongoing*, [GAO-18-636T](#) (Washington, D.C.: June 26, 2018). Community care and "community providers" refer, respectively, to the services the department purchases outside VA medical facilities for veterans and other eligible beneficiaries, and the non-VA providers who deliver the services.

provide care to service members transitioning from DOD to VA's health care system.

We have previously reported on VA's challenges in managing health information technology and modernizing VistA. In 2015, we designated VA health care as a high-risk area for the federal government, in part due to its information technology challenges.¹⁶ Specifically, 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 2019 update to the high-risk series, we stressed that VA 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 by establishing metrics and mechanisms for assessing and reporting progress. We also have issued numerous reports over the last decade that highlighted the challenges facing VA in modernizing VistA and improving EHR interoperability with DOD.¹⁷

EHR Modernization Efforts, Including Goals of Improved Sharing of Health Information between VA and DOD

VA created the Office of Electronic Health Record Modernization in 2018 to lead its EHRM program effort, which was intended to result in a more modern EHR system that would improve providers' ability to deliver care, and share health data, including between VA and DOD and between VA and community providers. For example, with improved interoperability, medical providers would have the ability to query data from other sources

¹⁶GAO 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 issues were highlighted in our 2015 high-risk report, GAO, *High-Risk Series: An Update*, [GAO-15-290](#) (Washington, D.C.: Feb. 11, 2015); GAO, *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 GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

¹⁷See GAO, *Electronic Health Records: VA Needs to Identify and Report System Costs*, [GAO-19-125](#) (Washington, D.C.: July 25, 2019); *VA Health IT Modernization: Historical Perspective on Prior Contracts and Update on Plans for New Initiative*, [GAO-18-208](#) (Washington, D.C.: Jan. 18, 2018); *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: 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 *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).

while managing chronically ill patients, regardless of geography, or the network on which the data reside.¹⁸

In June 2017, the VA Secretary at the time announced that the department planned to acquire and configure the same EHR system that DOD is currently implementing across the military health system. According to the VA Secretary, the department decided to acquire the same system as DOD because it would allow all of VA's and DOD's patient data to reside in one system, thus assisting the departments in their goals of enabling seamless care between VA and DOD without the exchange and reconciliation of data between two separate systems. As VA planned to implement the same system DOD is implementing, experts recommended that VA and DOD coordinate to ensure that the departments could leverage efficiencies and minimize variation between the departments' EHR system configurations when practical.¹⁹

DOD's initial implementation of the Cerner EHR system occurred between February and October 2017 at four military treatment facilities in the state of Washington. In September 2019, the system was implemented at four additional military treatment facilities in California and Idaho. DOD plans to continue to implement the EHR system in 23 phases through 2023 with the next implementation expected to take place at eight additional military treatment facilities in California and Nevada.²⁰

EHR System's Implementation Timeline

VA's EHRM program originally planned to implement the Cerner EHR system at two VA medical facilities in spring 2020 with a phased implementation of the remaining facilities over the next decade.²¹ The EHRM program chose the Mann-Grandstaff VA Medical Center in

¹⁸EHR interoperability refers to the ability of EHR systems to exchange electronic health information with other systems and process the information without special effort on the part of the user, such as a health care provider. See GAO, *Electronic Health Records: Nonfederal Efforts to Help Achieve Health Information Interoperability*, [GAO-15-817](#) (Washington, D.C.: Sept. 16, 2015).

¹⁹The MITRE Corporation coordinated the assessment and reported related recommendations in the *VA EHRM Request for Proposal Interoperability Review Report* on Jan. 31, 2018.

²⁰We have ongoing work to evaluate DOD's implementation of MHS Genesis.

²¹Initial operating capability represents the system functionality that will be in place at the implementation of the new EHR at the first VA medical center where it is implemented. Additionally, the community based outpatient clinics using that VA medical facility's version of VistA will provide care using the new EHR once it is implemented.

Spokane, Wash. and the VA Puget Sound Health Care System in Seattle, Wash. as its initial operating capability sites.²² Information gathered from these sites will be used to help VA make EHR system configuration decisions and standardize work processes for future locations where the commercial EHR system will be implemented.

In August 2019, the EHRM program adjusted its schedule to implement the commercial EHR system at these two sites in two phases, known as capability sets 1 and 2:

- Capability set 1 includes key EHR functionalities necessary to implement the system at the Mann-Grandstaff VA Medical Center, a level 3—that is, less complex—facility. Capability set 1 was originally scheduled for implementation in March 2020.
- Capability set 2 includes remaining functionalities necessary to implement the system at the VA Puget Sound Health Care System, a level 1—that is, highly complex—facility, in the fall of 2020.

In February 2020, VA postponed the implementation of the Cerner EHR system at the Mann-Grandstaff VA Medical Center until July 2020. According to VA officials, the additional time will allow Cerner to develop and establish a more complete and robust training environment, as requested by VHA clinicians and other facility staff. In addition, according to VA EHRM program officials, the implementation delay will allow VA and Cerner to have time to develop additional interfaces between the Cerner EHR system and other VA systems, such as VA's mail-order pharmacy system. These officials told us that the delayed implementation of the Cerner EHR system at the Mann-Grandstaff VA Medical Center was not expected to impact VA's timeline for implementing the EHR system at the VA Puget Sound Health Care System in the fall of 2020.

In April 2020, the VA Secretary announced that the department had shifted priorities to focus on caring for veterans in response to the pandemic created by the Coronavirus Disease 2019 (COVID-19).²³ Further, the Secretary directed the EHRM program to allow clinicians who

²²The Puget Sound Health Care System includes two divisions, Seattle and American Lake. VA manages the two divisions in an integrated manner.

²³Coronaviruses can cause respiratory issues, such as pneumonia, and are most commonly transmitted by coughing, sneezing, person-to-person contact, and touching objects that have viral particles on them, according to the Centers for Disease Control and Prevention. For more information on COVID-19, see GAO, *Science & Tech Spotlight: Coronaviruses*, [GAO-20-472SP](#) (Washington, D.C.: Mar. 3, 2020).

had been participating in EHRM program activities to focus on caring for veterans. According to program officials, they paused the implementation of the EHR system and were assessing the impact of the COVID-19 pandemic on VA's planned implementation schedule.

VA Used a Multi-Step Process to Make EHR Configuration Decisions and Assess System Compatibility

VA's EHRM program used a multi-step process to make EHR system configuration decisions for the Cerner EHR system being implemented at the VA Mann-Grandstaff Medical Center and Puget Sound Health Care System. This process included forming EHR councils and convening these councils at national and local workshops to make configuration decisions used by VA's contractor, Cerner, to configure the new EHR system. The EHR councils also assessed the compatibility of the EHR system with the processes VA clinicians and staff follow in delivering care.

EHR councils. In fall 2018, VA's EHRM program established 18 EHR councils, based upon specific clinical and administrative areas, to make VA-specific EHR system configuration decisions for these areas.²⁴ Each EHR council included subject-matter experts from VA, such as health care providers in various clinical areas and other staff, as well as non-VA participants from DOD and Cerner.

According to VA EHRM program officials, Cerner's typical process for configuring its EHR system was modified to accommodate VA's needs, which VA officials stated were more complex than those of Cerner's commercial clients. According to Cerner officials, Cerner does not typically establish councils as part of its EHR system configuration process.

National workshops. VA's EHRM program planned and held eight national workshops from November 2018 to October 2019, during which members of all 18 EHR councils met to make standardized EHR system configuration decisions for the VA health care system.²⁵ VA's EHRM

²⁴The 18 EHR councils were: Acute Care Delivery; Acute Provider; Ambulatory; Behavioral Health; Business Operations (Revenue Cycle); Clinical Support Services; Community Data Integration; Dentistry; Emergency Medicine; Geriatrics and Extended Care; Patient Engagement and Virtual Health; Perioperative Care; Pharmacy; Quality, Safety, and Value; Rehabilitation and Acute Clinical Ancillaries; Supply Chain; Technical Management; and Workforce Management and Operations.

²⁵Some of the EHR councils held additional virtual—via teleconference or videoconference—meetings between national workshops.

program utilized DOD's version of the Cerner EHR system—MHS Genesis—as its starting point for the EHR system configuration process.

During the workshops, Cerner

- assigned consultants to facilitate these workshops, who highlighted Cerner's commercial best practices and prepared workflow designs, according to VA EHRM program and Cerner officials;
- facilitated EHR system configuration decision discussions and noted input from EHR council members and other session participants such as DOD representatives;
- held sessions that involved members from different EHR councils for system configuration decisions that required coordination between councils. For example, the Business Operations Council and the Ambulatory Council held joint sessions to address scheduling appointments for oncology patients;
- was responsible for identifying and documenting recommendations for EHR system configuration decision differences between VA sites, and each medical facility specialty/department;²⁶ and
- provided weekly progress updates to VA that reflected overall progress of expected decisions to be completed compared to the actual approved EHR system configuration decisions during national workshops.

Over the course of the eight national workshops, EHR council members were responsible for

- making EHR system configuration decisions in given clinical and administrative areas and communicating them to Cerner;
- providing progress updates to VA's EHRM program and VA leadership; and

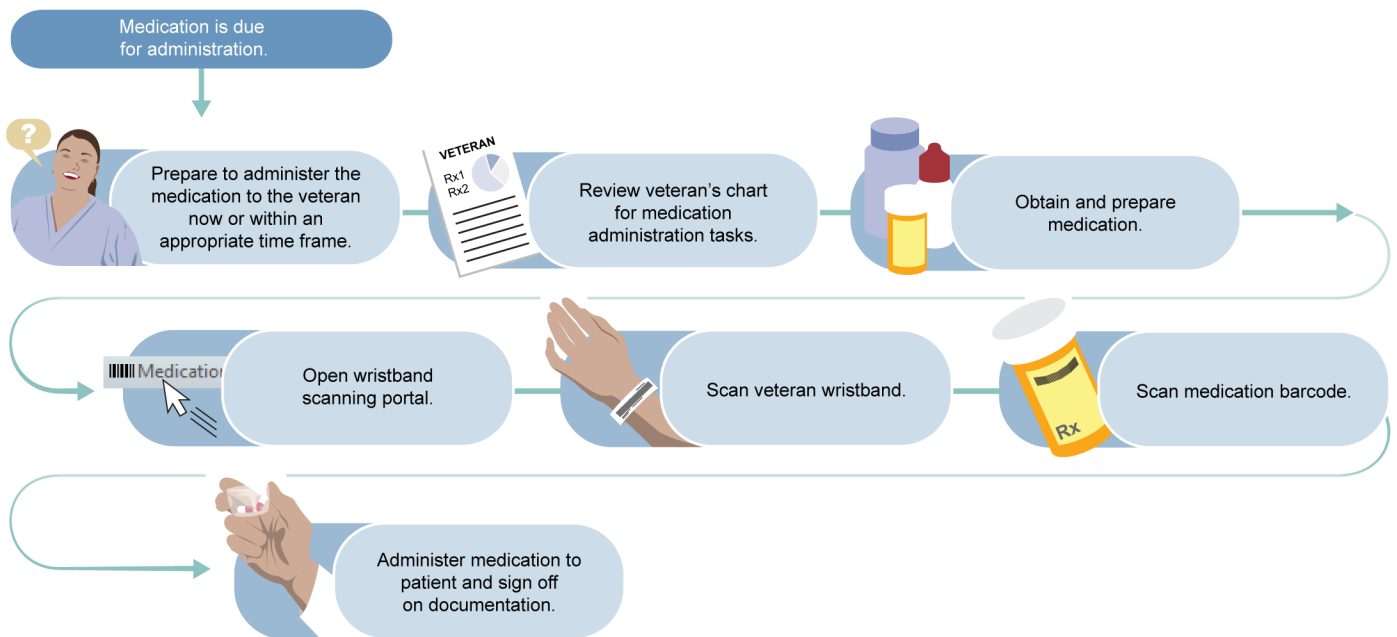
²⁶According to Cerner, commercial best practices are a collection of strategic recommendations for leveraging different versions of Cerner's EHR system solutions to "achieve optimal user experience and deliver high-quality health care." Based on an extract of data on design decision matrices from November 20, 2019, 86 of 1429 or approximately 6 percent of VA's design decisions deviated from Cerner's recommendation. According to EHRM program officials, for decisions that do not align with Cerner's recommendation, there is a rationale for why VA is deviating from the recommendation, such as the need to follow regulation.

- notifying appropriate governing bodies (e.g., VHA program offices—such as the Office of Primary Care) of any local, state, federal, VISN, and department policies that impact configuration decisions.

More specifically, each council discussed VA’s work processes and documented relevant information that informed the configuration of the EHR system, including:

(1) “workflows”—“process maps” that capture the start-to-finish sequence and interactions of related steps, activities, or tasks for each work process that VA medical facilities follow. For example, VA has a medication administration workflow for describing the sequence of tasks needed for scanning a patient’s wristband and administering medication. (See fig. 1.)

Figure 1: Simplified Example of a Workflow for Medication Administration



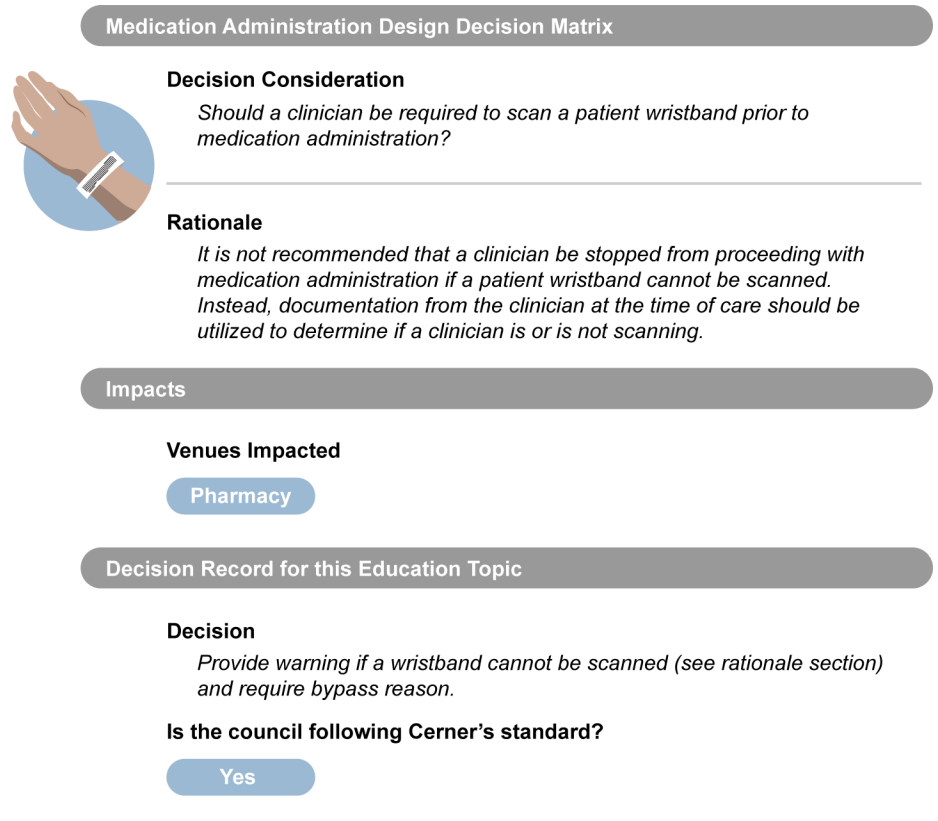
Source: Department of Veterans Affairs. | GAO-20-473

Note: Workflows are “process maps” that capture the start-to-finish sequence and interactions of related steps, activities, or tasks for each work process that VA medical facilities follow.

(2) “design decision matrices,” which are compilations of decisions and discussion topics that identify and resolve workflow questions to inform configuration decisions and support implementation of the EHR system. For example, the medication administration design decision matrix

documents that clinicians should not be prevented from proceeding with medication administration if a patient's wristband cannot be scanned. (See fig. 2.)

Figure 2: Example Design Decision Matrix for Medication Administration

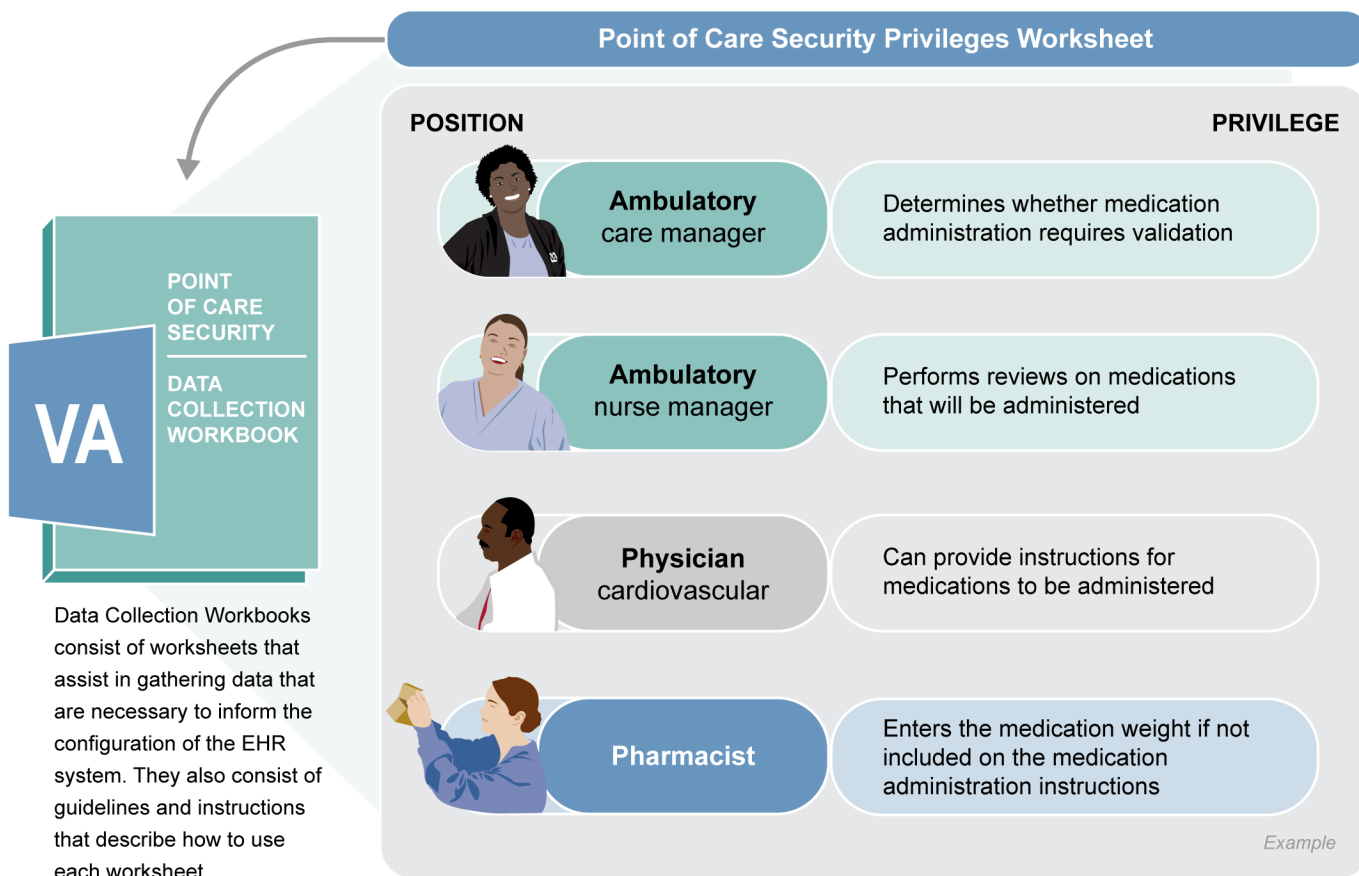


Source: Adapted from Cerner Government Services, Inc. documentation. | GAO-20-473

Note: Design decision matrices are compilations of decisions and discussion topics to address and support implementation of the EHR system.

(3) “data collection workbooks,” which capture all of the data needed to inform how the EHR system should be configured to support each workflow, such as user privileges and preferences.²⁷ For example, a data collection workbook for medication administration includes data on user preferences and prescribing privileges. (See fig. 3.)

Figure 3: Example Data Collection Workbook for Medication Administration



Source: Adapted from Cerner Government Services, Inc. documentation. | GAO-20-473

Note: Data collection workbooks capture all of the data that need to be incorporated in the EHR system for each workflow.

²⁷According to a VA EHRM program official, there is no correlation between the number of workflows, design decision matrices, or data collection workbooks. For example, design decision matrices may not be needed for every workflow. The Dentistry Council did not have any design decision matrices but approved 20 workflows.

The EHR system configuration decisions each council needed to make varied significantly in quantity and topic. For example, the Ambulatory Council, charged with focusing on primary care decisions, had over 200 EHR system configuration decisions to make, while the Behavioral Health Council had about 100.

Once configuration decisions were made, the EHR councils assessed the compatibility of the configuration of the Cerner EHR system with VA work processes. To do so, VA's EHR councils reviewed the capabilities of the system and identified work processes that the Cerner EHR system did not support (or only partially supported). For example, according to VA Mann-Grandstaff Medical Center staff, the Cerner EHR system did not originally interface with VA's Patient Centered Management Module, which supports VA's work processes for establishing provider-patient relationships.²⁸ However, in March 2020, VA EHRM officials told us that the interface between the two systems would be available when the Cerner EHR system is implemented at the Mann-Grandstaff VA Medical Center, which was planned for July 2020. In addition, according to VA EHRM officials, Cerner is in the process of developing EHR system capabilities for prosthetics to support VA work processes. Furthermore, according to VA EHRM officials, Cerner has been documenting and tracking needed capabilities for EHR implementation and updating VA's EHRM program accordingly. According to EHRM program officials, Cerner plans to include functionalities not available in capability set 1 in either capability set 2 or future capability sets, although the development of these capabilities is an ongoing process.

Although the eight national workshops have concluded, since October 2019, these EHR councils have continued to meet as necessary, virtually, and in person, to complete capability set 1 and 2 configuration decisions. According to Mann-Grandstaff VA Medical Center staff, as of February 2020, VA still needed to make EHR system configuration decisions to address online prescription refills and assigning patients to primary care panels.

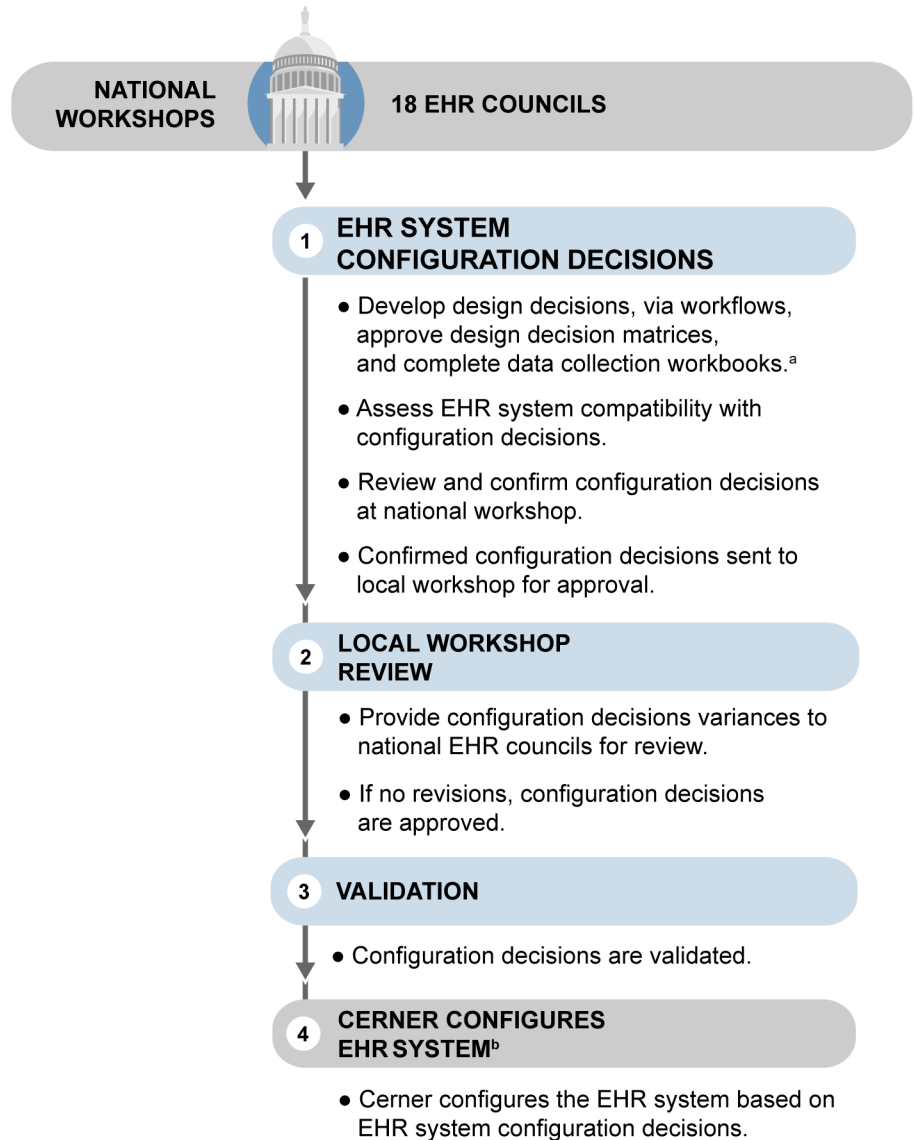
²⁸The Patient Centered Management Module is an application VA developed that enables users to (1) set up and define health care teams, (2) assign staff and their associated full-time equivalent staff to positions within each team, (3) assign patients to the team, and (4) assign patients to specific team members. The module also helps measure patient volume and the provider's capacity to meet that volume and reduce wait times.

Local Workshops. After standardized EHR system configuration decisions were made at the national workshops, they were reviewed at local workshops for site-specific needs. To do this, from December 2018 to October 2019, VA's EHRM program held eight local workshops at each of the initial operating capability sites—the Mann-Grandstaff VA Medical Center and the VA Puget Sound Health Care System.

Local workshops allowed VA and Cerner to identify variances from standardized EHR system configuration decisions made at the national workshops as well as manual processes that needed to be accounted for at local medical facilities. If variances were identified, Cerner reported them to the appropriate EHR councils. While VA tried to minimize the variances in system configuration decisions, in certain cases, necessary alternatives to these configuration decisions were approved for local medical facilities if practicable. For example, according to a Cerner official, the national emergency room triage workflow originally called for an emergency department registrar to register a patient; in response to input from a local workshop, VA developed an alternative workflow, in which an emergency department registered nurse completes the step if a VA facility does not have an emergency department registrar. If there were no variances, EHR system configuration decisions were approved and reported to Cerner to configure the EHR system.

According to EHRM program officials, VA plans to hold local workshops in advance of the Cerner EHR system implementation at future VA medical facilities to focus on site-specific configuration decisions. Cerner will continue to facilitate these future local workshop sessions and configure the EHR system based on decisions made at these sessions. Figure 4 provides an overview of the EHR councils' process for making system configuration decisions.

Figure 4: Department of Veterans Affairs (VA) Electronic Health Record (EHR) Council Process for Making EHR System Configuration Decisions



Source: Department of Veterans Affairs. | GAO-20-473

^aWorkflows capture the start-to-finish sequence and interactions of related steps, activities, or tasks for each workflow; design decision matrices are compilations of decisions and discussion topics to address and support implementation of the EHR system; and data collection workbooks capture all the data needed to be incorporated into the EHR system for each workflow.

^bThe scope of our work was limited to examining VA's EHR system configuration decisions. We did not examine Cerner's process for actually configuring and implementing the EHR system.

VA Met Its Schedule for Making Initial EHR System Configuration Decisions, and Has Formulated a Schedule for Remaining Efforts

VA met its schedule for making EHR system configuration decisions for capability set 1, which was scheduled for initial implementation at the Mann-Grandstaff VA Medical Center in July 2020.²⁹ In addition, VA has formulated a schedule for remaining EHR system configuration decisions for capability set 2, which it planned to implement at the VA Puget Sound Health Care System in the fall of 2020.

VA Met Its Schedule for Making System Configuration Decisions for Capability Set 1

Our review of VA progress data shows that VA met the schedule for making EHR system configuration decisions it had established, which required VA's 18 EHR councils to make at least 70 percent of decisions needed for capability set 1 by October 18, 2019.³⁰ An EHRM program official stated that this threshold was required to enable Cerner to configure the EHR system for the Mann-Grandstaff VA Medical Center in anticipation of the system's initial implementation.

According to VA's progress data, collectively, the 18 EHR councils met the requirement to make at least 70 percent of their total expected EHR system configuration decisions for capability set 1. Specifically, as of early November 2019, VA data for EHR configuration decisions needed for capability set 1 indicated that the EHRM program had developed:

- 877 of 966 (or 91 percent) of workflows;
- 1,397 of 1,412 (or 99 percent) of design decision matrices; and

²⁹As stated previously, VA officials informed us the implementation of capability set 1, which was originally scheduled for March 2020, was delayed. The officials informed us that the reasons for the delay were factors such as Cerner needing additional time to develop and establish a more complete and robust training environment and to build interfaces between the EHR system and other VA systems, which were areas outside the scope of this review. As of April 2020, according to VA EHRM program officials, VA had paused the implementation of the EHR system and was assessing the impact of the COVID-19 pandemic on its planned schedule.

³⁰Workflows, design decision matrices, and data collection workbooks are the different types of EHR system configuration decisions. According to an EHRM program official, the total number of decisions fluctuated as VA and Cerner became more familiar with Vista and VA's needs.

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- 1,364 of 1,610 (or 90 percent) of data collection workbooks.³¹

After the EHR councils collectively met VA's goal to make 70 percent of EHR system configuration decisions by October 18, 2019, efforts continued to make the remaining decisions for capability set 1. In March 2020, VA data indicated that, combined, the EHR councils had developed an additional:

- 9 percent of workflows—874 of 878 (or nearly 100 percent);
- 1 percent of design decision matrices—1,459 of 1,467 (or nearly 100 percent); and
- 10 percent of data collection workbooks—1,746 of 1,751 (or nearly 100 percent).³²

(See Appendix I for additional details on specific changes from November 2019 to March 2020 by EHR councils.)

As noted earlier, though the workshop process has concluded, a VA EHRM program official stated that they had plans to hold virtual—over teleconference or videoconference—meetings to allow the EHR councils to make remaining EHR system configuration decisions for capability set 1 at the Mann-Grandstaff VA Medical Center, by March 2020.

³¹Due to the VA's use of an "agile approach"—producing software in small, short increments—the data points described fluctuate often. The workflows and design decision matrices data reflect EHR configuration decisions for the development cycle ending on October 7, 2019 and we used data current as of November 13, 2019. For data collection workbooks, we used data current as of November 1, 2019. According to a VA EHRM program official, data collection workbooks vary in complexity, with some requiring significantly more effort to complete than others. Therefore, it is not possible to use the number of developed and expected data collection workbooks to calculate the percentage developed. The percentage reported is weighted by the level of effort required to develop the data collection workbooks for each council.

³²The workflows, design decision matrices, and data collection workbook data reflect EHR configuration decisions for the development cycle ending on October 7, 2019 and we used data current as of March 26, 2020. According to VA EHRM program officials, as VA made EHR system configuration decisions, the number of decisions fluctuated because workflows, design decision matrices, and data collection workbooks were added, combined, or deemed no longer necessary.

VA Has Formulated a Schedule for Capability Set 2 Configuration Decisions

VA's EHRM program has formulated a schedule for making EHR system configuration decisions for capability set 2, which are necessary to support the implementation of the Cerner EHR system at the VA Puget Sound Health Care System planned for the fall of 2020. Specifically, VA's EHRM program is continuing to make EHR system configuration decisions outside of the workshop process, which concluded in October 2019. Currently, EHRM program officials have plans to hold smaller meetings, about a fourth of the size of the national workshops, to make EHR configuration decisions that require input from multiple councils for capability set 2.

According to EHRM program officials, the program set a goal of developing capability set 2 workflows, design decision matrices, and data collection workbooks by May 2020 so that the EHR councils could start validating the system configuration decisions at that time. EHRM program officials anticipate that this schedule for capability set 2 gives Cerner enough time to configure the EHR system and establish a training environment to enable implementation of the EHR system at the VA Puget Sound Health Care System planned for the fall of 2020. According to program officials, capability set 2 is composed of about 90 percent of configuration decisions for capability set 1 and 10 percent of additional workflows and data collection workbooks. These officials also told us that, as part of the process of making capability set 2 configuration decisions, they would determine the effectiveness of these decisions based on the implementation of capability set 1 at the Mann-Grandstaff VA Medical Center and make any necessary changes.

VA's Decision-Making Procedures Were Generally Effective, but Key Stakeholders Were Not Always Included

VA's EHRM program established EHR council decision-making procedures that were generally effective. In addition, the councils included a wide range of stakeholders, in terms of geographic representation and representation from VA central office, VISNs, and medical facilities. However, according to EHR council participants, VA did not always ensure adequate representation at local workshops.

VA's EHRM Program's Decision-Making Procedures for EHR Councils Were Generally Effective

VA's EHRM program's decision-making procedures for the EHR councils were generally effective as demonstrated by adherence to applicable federal standards for internal control. According to these standards, management should establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives.³³ In addition, according to our leading collaboration practices, clarity can come from agencies working together to define and agree on their respective roles and responsibilities and participating agencies should document their agreement.³⁴

VA's EHRM program established the organizational structure, assigned responsibility, and delegated authority for system configuration decisions to the EHR councils. Specifically, the EHRM program developed a charter for the councils that

- outlined each council chair's responsibility for managing council membership and ensuring it is consistent with guidelines for broad representation;
- outlined council member roles and responsibilities, such as participating in face-to-face meetings and conferences, providing subject matter expertise, and guiding EHR system configuration decisions; and
- delegated authority for EHR system configuration decisions from the EHRM Chief Medical Officer to the council chair and members.

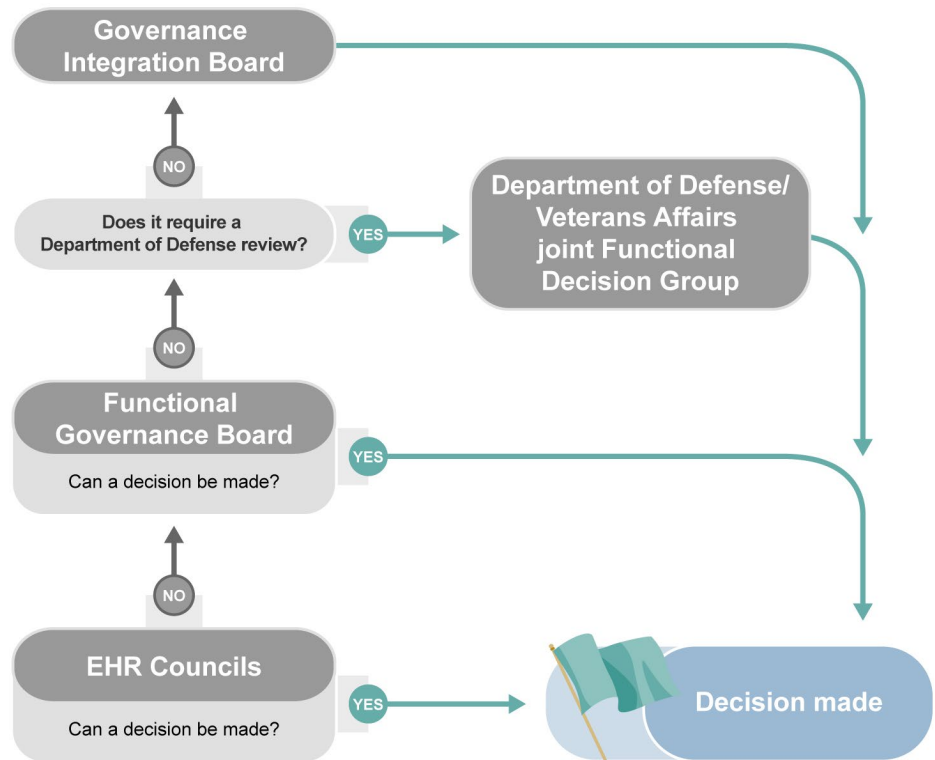
³³*Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

³⁴[GAO-12-1022](#).

According to EHRM program documentation, VA established decision-making authority at the lowest level possible, beginning with the EHR councils, to ensure timely and appropriate decision-making. Based on our observations of national council workshop meetings, if a council had questions that involved coordination with another council, the Cerner consultant present would take note of the issue and coordinate a meeting with the relevant councils to discuss the issue. For example, participants from the Ambulatory Council met with participants from the Rehabilitation and Acute Clinical Ancillaries Council to discuss the EHR system configuration decisions for ordering glasses and contacts.

Based on our review of the Functional Governance Board charter and meeting minutes, when a decision required coordination and could not be made at the EHR council level, it was identified and escalated to the Functional Governance Board. The Functional Governance Board provided guidance on addressing issues or, in turn, escalated unresolved issues to the higher-level Governance Integration Board, or if appropriate, to a joint VA and DOD coordination process. According to EHRM program officials, as of February 2020, there were no issues escalated from the Functional Governance Board to the Governance Integration Board because the council governance structure strived to make decisions at the lowest level possible. Figure 5 provides an overview of the EHRM program's decision-making procedures.

Figure 5: Department of Veterans Affairs (VA) Electronic Health Record Modernization (EHRM) Program Decision-Making Procedures



Source: Department of Veterans Affairs. | GAO-20-473

Note: The Department of Defense and VA joint Functional Decision Group is responsible for the evaluation of electronic health record (EHR) system configuration decisions impacting both departments.

With respect to collaboration, because VA is using the same system as DOD, VA has had to coordinate with DOD on some decisions. Although both departments have procedures for configuring the Cerner EHR system for their individual needs, VA EHRM program officials noted the importance of coordinating to design a system that would allow sharing of information and tasks between VA and DOD.

According to VA EHRM program officials, for example, VA and DOD coordination is necessary for workflows pertaining to durable orders for life-sustaining treatments—medical treatments intended to prolong the life of a patient who would die soon without the treatment (e.g., artificial nutrition and hydration, and mechanical ventilation). VA and DOD’s practices differed on how to address such treatment, and Cerner’s

process did not accommodate VA's need to maintain durable orders across patient encounters, so they would not need to be re-written every time a patient changed care setting or location.³⁵ VA requested changes to the Cerner EHR system to allow it to continue to follow its current process for documenting life-sustaining treatments, but according to DOD officials, the proposed changes did not align with DOD's position on such treatments, specifically resuscitation statuses. After multiple discussions between the VA and DOD clinicians, the two departments plan to adopt an interim solution.

According to VA and DOD officials, VA and DOD's joint decision-making body, the Functional Decision Group, has met weekly to address coordination issues since early 2019.³⁶ These officials said that the joint Functional Decision Group determined whether it could make a decision, or whether additional information was needed and a team should be established to work on dispute resolution between the departments. VA EHRM program officials said that the coordination procedures for the joint Functional Decision Group would be formalized and that the roles and responsibilities for coordination between VA and DOD would be clearly defined, in response to a recommendation we made in a previous report.³⁷ Specifically, VA and DOD have developed a charter for the joint Functional Decision Group, which was signed in April 2020.

According to EHR council participants, VA and DOD had been developing their coordination procedures as system configuration decisions were made, and decisions that required input from both departments may not have been as timely as they could have been. According to EHRM

³⁵Durable orders mean that orders do not need to be re-written in the EHR every time a patient changes care settings or locations.

³⁶According to EHRM program officials, the joint Functional Decision Group was formerly the Joint Executive Functional Triage Group, and was run by the Interagency Program Office. The Interagency Program Office has been re-chartered into the Federal Electronic Health Record Modernization Program Office.

³⁷In September 2018, we recommended that the Secretary of VA ensure that the roles and the responsibilities of the Interagency Program Office are clearly defined within the governance plans for acquisition of the department's new EHR system. The Interagency Program Office was established to act as a single point of accountability for VA and DOD electronic health care exchange efforts. See GAO, *Electronic Health Records: Clear Definition of the Interagency Program Office's Role in VA's New Modernization Effort Would Strengthen Accountability*, [GAO-18-696T](#) (Washington, D.C.: Sept. 13, 2018) and *Priority Open Recommendations: Department of Veterans Affairs*, [GAO-19-358SP](#) (Washington, D.C.: Mar. 28, 2019).

program officials, the departments ultimately were able to address most decisions and coordination on remaining decisions was ongoing as of March 2020.

VA's EHRM Program Included a Wide Range of Participants at National and Local Workshops, but Did Not Always Ensure the Involvement of Key Stakeholders

VA's EHRM Program Largely Met EHR Council Charter Goals for Representation

VA generally included a wide range of stakeholders in its 18 EHR councils.³⁸ Specifically, VA was largely in line with its EHR councils' charter goals to include about 60 percent of council members from the field, with the remainder from the central office, and to have representatives from a range of geographic locations and with sufficient experience and expertise:

- VA data show that EHR councils had about 58 percent (607 of 1,039) of its members representing the field and about 40 percent (415 of 1,039) representing VA's central office, roughly in line with VA's goals.³⁹
- The councils included participants from a variety of geographic regions, including each of its 18 VISNs, with the most participants representing VISN 20, which oversees the two medical facilities where the new EHR system is scheduled to be initially implemented.
- Participants primarily represented the most complex level of VA medical facilities. Specifically, VA data show that about 83 percent (861 of 1,039) of participants represented level 1 VA medical facilities, whereas about 3 percent (33 of 1,039) and 7 percent (75 of 1,039) represented medium (level 2) and low (level 3) complexity VA medical facilities, respectively.⁴⁰ EHRM program officials said that the majority of participants represented higher-complexity facilities because participants were drawn from national experts and published authors, and often performed VA-specific processes. Furthermore, smaller medical centers had fewer resources so clinicians were more likely to

³⁸As previously stated, EHR council chairs were responsible for managing council membership and ensuring membership was consistent with charter goals for broad representation.

³⁹These percentages include council chairs, members, and consultants. For 17 participants (about 2 percent), the information on whether the participant represented the field or VA's central office was unknown or not reported.

⁴⁰For about 70 participants, or about 7 percent, the information on facility complexity level was unknown or not reported.

be needed to continue providing patient care at those facilities and less likely to be available to serve on councils.

- According to a voluntary questionnaire VA asked council participants to complete, about 37 percent of the 304 participants who completed the survey had at least 6 years of experience at VA; 29 percent had at least 16 years of experience; and, 19 percent had more than 25 years of experience.⁴¹
- In addition to participants from the VA, we observed that EHR council national workshop meetings included participants from outside of the department—such as clinicians from DOD sites and commercial health care systems that had already implemented Cerner’s EHR system. These participants provided support for discussions and insight into industry best practices.

While the EHR councils included a wide range of participants, in September and October 2019, council participants from both of the initial operating capability sites raised concerns that the councils did not include adequate representation from specialty areas at national workshop meetings. Specifically, these officials said that an insufficient number of specialty physicians, including pulmonologists and gastroenterologists, were included. In addition, VA’s summary from the last workshop, national workshop 8, observed that additional subject matter experts representing medical specialties should be included in the EHR system configuration decision process to enhance collaboration and decision-making.

EHRM program officials, including the Chief Medical Officer and Ambulatory Council chairs, said they had not included certain specialists and scheduled workshops on specialty areas, such as pulmonology and gastroenterology as they decided to focus first on more foundational decisions, such as those for primary care. Starting in November 2019, following the completion of the eight national workshops, VA EHR councils continued to meet, as necessary, to complete capability set 1 and 2 configuration decisions and had begun to include clinicians from specialty areas in these meetings. VA plans to continue these meetings through September 2020. VA’s approach of including clinicians from specialty areas in ongoing configuration decision meetings is generally

⁴¹The Department of Veterans Affairs Office of Electronic Health Record Modernization administered a questionnaire on change readiness in May 2019. These results are based on responses from 304 of 982 council members surveyed, as reported in July 2019.

consistent with our leading collaboration practice that agencies should ensure that all relevant participants be included in any collaborative effort they undertake.⁴²

By including relevant participants, the program increases the likelihood that it has considered input from participants with unique knowledge, skills, and abilities.⁴³ Further, including relevant participants increases the likelihood that when implemented, the EHR system will be properly configured to meet the needs of clinicians, and effectively support their efforts to deliver care.

VA's EHRM Program Did Not Always Include Key Stakeholders at Its Local Workshops

Local workshops at the Mann-Grandstaff VA Medical Center and VA Puget Sound Health Care System did not always include representation from relevant stakeholders, including facility clinicians and staff. Specifically, multiple participants in the local workshop meetings, including clinicians and department leads, at these facilities said that VA's EHRM program did not always effectively communicate information about local workshop meetings to facility clinicians and staff to facilitate the designation of staff to participate and ensure relevant representation at local workshops. Local workshop participants stated that they did not always know which local workshop meetings they needed to attend, because they did not receive adequate information about the session topics.

This is inconsistent with key collaboration practices identified in our prior work to ensure that relevant participants be included in any collaborative effort and that participating entities have agreed on common terminology.⁴⁴ Furthermore, standards for internal control in the federal government call for effective communication and information sharing.⁴⁵

⁴²See [GAO-12-1022](#).

⁴³See [GAO-12-1022](#).

⁴⁴[GAO-12-1022](#).

⁴⁵*Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

Local workshop participants, including clinicians and department leads from medical facilities said that differences in the use of terminology between VA and Cerner sometimes made it challenging to identify the clinicians and staff that should attend local workshop meetings. For example, some officials reported that they did not believe that a meeting on “charge services” would be relevant to their work given that VA does not typically bill veterans for services. However, they later learned that the meeting actually covered topics beyond billing, such as capturing workload data that was relevant to their work.⁴⁶

Because Cerner and VA did not always effectively communicate regarding workshop content for local workshops, local workshops did not always include all relevant stakeholders. As previously stated, VA plans to hold local workshops in advance of the Cerner EHR system implementation at future VA medical facilities. However, VA has not indicated how it will improve the ways in which it describes the topics of these workshops, including providing sufficient detail and defining key terms. If VA improves communication on workshop meeting topics, the EHRM program can increase the likelihood that it will obtain appropriate input from facility clinicians and staff at local workshops to consider in design decisions for the implementation of the EHR system.

⁴⁶Patient workload data is based on the number and type of veterans served and the complexity of care provided.

Conclusions

VA met its schedule for making the needed system configuration decisions that would enable the department to implement its new EHR system at the first VA medical facility, which was planned for July 2020. In addition, VA has formulated a schedule for making the remaining EHR system configuration decisions before implementing the system at additional facilities planned for fall 2020.

VA's EHRM program was generally effective in establishing decision-making procedures that were consistent with applicable federal standards for internal control. However, VA did not always ensure the involvement of relevant stakeholders, including medical facility clinicians and staff, in the system configuration decisions. Specifically, VA did not always clarify terminology and include adequate detail in descriptions of local workshop sessions to medical facility clinicians and staff to ensure relevant representation at local workshop meetings. Participation of such stakeholders is critical to ensuring that the EHR system is configured to meet the needs of clinicians and support the delivery of clinical care.

Recommendation for Executive Action

We are making the following recommendation to VA:

For implementation of the EHR system at future VA medical facilities, we recommend that the Secretary of VA direct the EHRM Executive Director to clarify terminology and include adequate detail in descriptions of local workshop sessions to facilitate the participation of all relevant stakeholders including medical facility clinicians and staff.
(Recommendation 1)

Agency Comments

We provided a draft of this report to VA and DOD for comment. In its comments, reproduced in appendix II, VA concurred with our recommendation and described steps that it planned to take to address it. Specifically, VA noted that it planned and designed its workshops to enable collaboration between clinical and administrative experts and end-users so that the EHR system is designed, validated, and configured to promote interoperability and quality care for veterans. VA stated that it is further refining local workshop agendas and descriptions to facilitate VA subject matter expert identification and participation. VA also provided technical comments on the report, which we incorporated as appropriate. DOD provided technical comments on the report, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretaries of VA and DOD, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact Debra A. Draper at (202) 512-7114 or DraperD@gao.gov or Carol C. Harris at (202) 512-4456 or 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 key contributions to this report are listed in appendix III.



Debra A. Draper
Director, Health Care



Carol C. Harris
Director, Information Technology
Management Issues

Appendix I: Status of Electronic Health Record System Configuration Decisions, as of November 2019 and March 2020

The Department of Veterans Affairs' (VA) data for each of the electronic health record (EHR) councils provide information on the EHR system configuration decisions—that is, the number of workflows, design decision matrices, and data collection workbooks—developed as of November 2019 and March 2020.¹

Workflow Development. In November 2019, 11 EHR councils had developed at least 95 percent of their expected workflows. As of March 2020, progress data indicated that all of the EHR councils developed at least 95 percent of their expected workflows. In addition, the expected number of workflows for some councils, including but not limited to Ambulatory, Business Operations, and Patient Engagement and Virtual Health, decreased. Other councils, such as, Clinical Support Services, increased.² Table 1, below, provides an overview of the workflows completed by VA's 18 EHR councils, based on data as of November 13, 2019 and March 26, 2020.

¹Workflows are “process maps” designed to capture the start-to-finish sequence and interactions of related steps, activities, and tasks for each work process. Design decision matrices are compilations of decisions and discussion topics to address and support implementation of the EHR system. Data collection workbooks capture all the data that need to be incorporated into the EHR system.

²According to a VA Electronic Health Record Modernization (EHRM) program official, as VA and Cerner completed workflow development activities, the expected number of workflows to be developed fluctuated.

Appendix I: Status of Electronic Health Record System Configuration Decisions, as of November 2019 and March 2020

Table 1: Workflow Development by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 13, 2019 and March 26, 2020

EHR Council	November 2019 ^a			March 2020 ^a		
	Developed	Expected	Percent developed	Developed	Expected	Percent developed
Acute Care Delivery	73	79	92	77	77	100
Acute Provider	29	30	97	30	30	100
Ambulatory	60	64	94	57	57	100
Behavioral Health	30	31	97	29	29	100
Business Operations	187	233	80	205	209	98
Clinical Support Services	101	102	99	103	103	100
Community Data Integration	8	5	160	5	4	125
Dentistry	20	20	100	17	17	100
Emergency Medicine	52	52	100	52	52	100
Geriatrics and Extended Care	80	84	95	84	85	99
Patient Engagement and Virtual Health	22	25	88	12	12	100
Perioperative Care	27	27	100	27	27	100
Pharmacy	72	75	96	74	73	101
Quality, Safety, and Value	43	60	72	29	29	100
Rehabilitation and Acute Clinical Ancillaries	34	37	92	31	32	97
Supply Chain	19	22	86	22	22	100
Technical Management	1	1	100	1	1	100
Workforce Management and Operations	19	19	100	19	19	100
Total	877	966	91	874	878	99.5

Source: GAO analysis of VA data. | GAO-20-473.

^aAccording to a VA Electronic Health Record Modernization (EHRM) program official, the number of expected and developed workflows fluctuated over time due to the department's use of an "agile approach"—producing software in small, short increments—and decreased in some cases as workflows were combined. This official also told us that some councils developed more workflows than expected by a given target date, therefore yielding a percent over 100 percent. Moreover, an official told us that the variances between councils in the development of workflows did not affect Cerner's effort to configure the EHR system.

Design Decision Matrices. Sixteen of the 18 EHR councils developed design decision matrices as part of their efforts to make configuration decisions for the new EHR system. By November 2019, 11 of these EHR councils had completed at least 100 percent of these design decision matrices. A VA EHRM program official stated that the two remaining EHR councils—Acute Clinical Ancillaries and Dentistry—were not responsible for developing any design decision matrices, but contributed to the efforts of other councils. Table 2 shows the number of design decision matrices

Appendix I: Status of Electronic Health Record System Configuration Decisions, as of November 2019 and March 2020

developed by each of the 18 EHR councils, based on data from November 13, 2019 and March 26, 2020.

Table 2: Design Decision Matrices Developed by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 13, 2019 and March 26, 2020

EHR Council	November 2019 ^b			March 2020 ^b		
	Developed	Expected	Percent developed	Developed	Expected	Percent developed
Acute Care Delivery	133	135	99	133	135	99
Acute Provider	136	136	100	136	136	100
Ambulatory	94	96	98	95	96	99
Behavioral Health	4	4	100	4	4	100
Business Operations	117	120	98	118	120	98
Clinical Support Services	164	164	100	164	164	100
Community Data Integration	57	68	84	66	67	99
Dentistry ^a	—	—	—	—	—	—
Emergency Medicine	98	98	100	98	98	100
Geriatrics and Extended Care	146	146	100	146	146	100
Patient Engagement and Virtual Health	51	51	100	51	51	100
Perioperative Care	57	57	100	57	57	100
Pharmacy ^b	168	153	110	167	153	109
Quality, Safety, and Value	31	31	100	31	31	100
Rehabilitation and Acute Clinical Ancillaries ^a	—	—	—	—	—	—
Supply Chain ^b	72	71	101	73	71	103
Technical Management	6	14	43	13	14	93
Workforce Management and Operations	62	62	100	62	62	100
Total^c	1,396	1,406	99	1414	1405	100.7

Legend: — = data not applicable.^a

Source: GAO analysis of VA data. | GAO-20-473

^aVA's Rehabilitation and Acute Clinical Ancillaries and Dentistry Councils were not responsible for developing any design decision matrices.

^bAccording to a VA Electronic Health Record Modernization (EHRM) program official, the number of expected and developed design decision matrices fluctuated over time due to the department's use of an "agile approach"—producing software in small, short increments. This official also told us that some councils exceeded the expected number of design decision matrices to be developed by a given target date, therefore yielding a percent over 100 percent. Furthermore, in some cases, the number of design decision matrices decreased as they were combined or deemed no longer necessary. Moreover, the official told us that the variances in the development of design decision matrices between councils did not affect Cerner's effort to configure the EHR system.

^cThe total does not match the summary data presented on design decision matrices due to differences in the dates each council reported its data.

**Appendix I: Status of Electronic Health Record
System Configuration Decisions, as of
November 2019 and March 2020**

Data collection workbooks. All EHR councils completed at least 80 percent of expected data collection workbooks. Specifically, by November 2019, three of the 18 councils completed 100 percent of them and by March 2020, each of the councils had completed 100 percent of their data collection workbooks.³ Table 3 shows the number of data collection workbooks completed in comparison to the total expected for each of the 18 EHR councils based on data from November 13, 2019 and March 26, 2020.

Table 3: Percentages of Data Collection Workbooks Developed by the Department of Veterans Affairs' (VA) 18 Electronic Health Record (EHR) Councils as of November 1, 2019 and March 26, 2020

EHR Council	November 2019 ^b			March 2020 ^b		
	Developed	Expected	Percent developed ^b	Developed	Expected	Percent developed ^b
Acute Care Delivery ^a	105	119	90	101	101	100
Acute Provider	56	61	98	60	60	100
Ambulatory	93	103	94	97	97	100
Behavioral Health	56	79	88	79	79	100
Business Operations	297	388	81	397	397	100
Clinical Content Management ^c	114	151	81	251	256	99
Clinical Support Services ^a	250	266	97	233	233	100
Community Data Integration	1	1	100	1	1	100
Dentistry ^a	2	2	100	2	2	100
Emergency Medicine	44	55	98	48	48	100
Geriatrics and Extended Care	69	72	98	76	76	100
Patient Engagement and Virtual Health	17	19	99	19	19	100
Perioperative Care	7	9	97	9	9	100
Pharmacy	13	18	97	29	29	100
Quality, Safety, and Value	7	13	87	17	17	100
Rehabilitation and Acute Clinical Ancillaries ^a	186	202	93	175	175	100
Supply Chain	3	3	100	3	3	100
Technical Management ^a	26	30	87	25	25	100
Workforce Management and Operations ^a	18	19	99	124	124	100
Total	1,364	1,610	90	1746	1751	99.9

Source: GAO analysis of VA data. | GAO-20-473

^aAccording to a VA Electronic Health Record Modernization (EHRM) program official, the number of data collection workbooks fluctuated over time due to the department's use of an "agile approach"—producing software in small,

³Table 3 includes a row for clinical content management, a means to capture clinical content areas that have been identified and not yet assigned to a specific council, according to an EHRM program official.

**Appendix I: Status of Electronic Health Record
System Configuration Decisions, as of
November 2019 and March 2020**

short increments—and, in some cases, decreased as data collection workbooks were combined or deemed no longer necessary. This official also told us that the variances between councils in the numbers of data collection workbooks developed did not affect Cerner’s effort to configure the EHR system.

^bAccording to a VA EHRM program official, data collection workbooks vary in complexity, with some requiring significantly more effort to complete than others. Therefore, it is not possible to use the number of developed and expected data collection workbooks to calculate the percent developed. The percentage reported is weighted by the level of effort required to develop the data collection workbooks for each council.

^cAccording to an EHRM program official, “Clinical Content Management” is not an EHR council but a means to capture clinical content areas that have been identified and not yet assigned to a specific council.

Appendix II: Comments from the Department of Veterans Affairs



THE DEPUTY SECRETARY OF VETERANS AFFAIRS
WASHINGTON

MAY 18 2020

Ms. Debra A. Draper
Director
Health Care
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Draper:

The Department of Veterans Affairs (VA) has reviewed the Government Accountability Office (GAO) draft report: ***ELECTRONIC HEALTH RECORDS: Ongoing Stakeholder Involvement Needed in the Department of Veterans Affairs' Modernization Effort*** (GAO-20-473).

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Pamela Powers".

Pamela Powers
Acting Deputy Secretary

Enclosure

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

Attachment

The Department of Veterans Affairs (VA) Comments to the
Government Accountability Office (GAO) Draft Report
***ELECTRONIC HEALTH RECORDS: Ongoing Stakeholder Involvement Needed
in the Department of Veterans Affairs' Modernization Effort***
(GAO-20-473)

General Comments:

The Department of Veterans Affairs (VA) Office of Electronic Health Record Modernization (OEHRM) appreciates the opportunity to review the Government Accountability Office (GAO) draft report regarding stakeholder involvement. OEHRM considers the national and local workshops foundational to the workflow development process for VA's new electronic health record (EHR) solution. VA planned and designed these workshops to enable collaboration between business operations experts and clinical end-users so that the EHR solution is designed, validated and configured to promote interoperability and quality care for our Nation's Veterans.

1 of 3

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

Attachment

The Department of Veterans Affairs (VA) Comments to the
Government Accountability Office (GAO) Draft Report
***ELECTRONIC HEALTH RECORDS: Ongoing Stakeholder Involvement Needed
in the Department of Veterans Affairs' Modernization Effort***
(GAO-20-473)

GAO Recommendation: For implementation for the EHR system at future VA medical facilities, we recommend that the Secretary of VA direct the EHRM Executive Director to clarify terminology and include adequate detail in descriptions of local workshop sessions to facilitate the participation of all relevant stakeholders including medical facility clinicians and staff.

VA Comment: Concur. Based on experience and lessons learned from completed national and local workshops, the Department of Veterans Affairs (VA) is further refining terminology and improving stakeholder engagement at local workshops. Specifically, VA is taking action by engaging with Puget Sound site leadership on the local workshop structure, refining local workshop session agendas and descriptions to facilitate local subject matter expert identification and participation; and curating a shared lexicon that can be leveraged throughout site engagement activities.

Target Completion Date: December 2020 (to implement and observe initial impact of the changes above).

2 of 3

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Debra A. Draper, (202) 512-7114 or DraperD@gao.gov

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

Staff Acknowledgments

In addition to the individuals named above, Mark Bird (Assistant Director), Michael Zose (Assistant Director), Merry Woo (Analyst-in-Charge), Bianca Eugene, and Paris Hawkins made key contributions to this report. Also contributing were Jennie F. Apter, Giselle Hicks, Monica Perez-Nelson, and Ethiene Salgado-Rodriguez.

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