VA’s Electronic Health Record (EHR) Initiatives in 2016-2018
March 3, 2016

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Conflict of Interest

David Waltman and Jonathan Nebeker, M.S., M.D. have no real or apparent conflicts of interest to report.

Learning Objectives

• Articulate the vision for Electronic Health Record (EHR) modernization through 2018
• Identify the VA’s EHR priorities, timelines, and resources
• Recognize the key challenges
• Outline specific opportunities for collaboration
Agenda

- Electronic Health Record (EHR) Efforts
- VA EHR Initiatives
- Interoperability and Security Highlight
- eHMP (New EHR)
  - Architecture
  - Value
How Benefits Were Realized for the Value of Health IT

The VA’s EHR modernization initiatives meet all five of the components of the STEPS initiative.

The following presentation will display how these efforts and capabilities fit into the STEPS framework.
Introduction

• **Veterans Health Information Systems and Technology Architecture (VistA)** is an enterprise-wide information system with software modules for financial functions, infrastructure functions, and clinical care.
Legacy EHR System

• The **Computerized Patient Record System (CPRS)** is a VistA computer application that enables the user to enter, review, and update all information with any patient. Including but not limited to:
  – Laboratory Tests
  – Medication Orders
  – Radiology Tests
  – Allergies
  – Progress Notes
  – Treatments
  – Discharge Summaries

• **VistAWeb** is a web-based application enhancement to CPRS that permits more robust and timely retrieval of remote-site patient data.
The following CATEGORY I record flags were found:

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<th>Notes</th>
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<th>Patient Name</th>
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<th>DOB</th>
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Interim EHR Solution

- The **Joint Legacy Viewer (JLV)** system provides a standards-based, integrated, chronological view of real-time electronic health record information from **all VA and Department of Defense (DoD) facilities** where a patient has received care as well as from VA external partners in a workflow configurable display.
  - 28,138 VA JLV Users as of January 17, 2016
  - 63,684 invited, 26,731 (42%) accepted
  - 12,838 active users (46% of users with access)
- JLV has been available at **all VA Medical Centers and Regional Offices** since October 1, 2014 and serves as a **transitional capability**.
- VA will continue to add new users to JLV until the new EHR system is available across the enterprise, then JLV users will **migrate**.
Future EHR Solution

• The **Enterprise Health Management Platform (eHMP)** is a multi-year effort designed to provide a new **web-based clinical application** that will eventually replace the legacy system, CPRS.

  – eHMP will **incorporate and enhance CPRS functionalities** as well as introduce new clinical capabilities, including but not limited to:

    - User Interface (UI)
    - A clinical data services engine
    - Clinical Decision Support
    - Context Persistence
    - Orders Selection Service
    - Orders Management Service
    - Data Annotation Service
    - Clinical Workflow
    - Concept Relationship Service
    - Documentation and Text Search Service
    - Business Rules Management System
Conceptual EHR Progression

CPRS/VistAWeb

JLV

eHMP
VA’s EHR Modernization

- This is a joint effort of VA Office of Information and Technology (OI&T) and Veterans Health Administration (VHA) that will oversee the evolution of VistA into a next generation system that is interoperable with the Department of Defense’s (DoD’s) Electronic Health Record (EHR).

- Will promote improved outcomes in quality, safety, efficiency, and satisfaction in health care, including care purchased in the community, for Veterans, Service members, and their dependents.

- Improves cost, speed, quality and minimizes risk of Health Information Technology (HIT) acquisitions by using platform with open standards.
Challenges for Interoperable Healthcare

1,700+ Care Locations
Including locations in each state, and in U.S. territories

~22M Eligible Beneficiaries,
~9.11M Enrollees,
8.76M Active Users
VA primarily cares for a population that has long term medical needs

78% of Enrollees Have Other Health Insurance
Enrollees receive approximately 34% of their health care from VA

130 Instances of Electronic Healthcare System with 100+ Modules
As EHR functionality evolved, VA incorporated new modules into VistA to meet functional requirements

Sources: Department of Veterans Affairs. National Center for Veterans Analysis and Statistics. Updated Feb 19, 2015; VHA website. 2015 VA Enrollee Health Care Projection Model
Interoperability

• A key objective is to enhance cross Agency (DoD/VA) interoperability by providing all **clinically relevant data at the point of care for Veterans**

• Improved interoperability will enhance communication among VA health care partners by ensuring that **authorized beneficiary and medical data are accessible, usable, shared, secured and sufficient** to meet the needs of Veterans and their care team in real-time

• **Timely access** to all clinically relevant patient records, regardless of the institution that provided the care, is critical in order for Veterans to have **efficient, safe and effective care coordination**. Enhanced interoperability will also provide the foundation for better clinical decision support, which providers will use to improve Veterans’ health
JLV Interoperability Value

• Data availability
  – 99.46% Clinical data in JLV from relevant VA and DoD sources

• Efficiency of Care Coordination
  – Back and forth care (polytrauma): Instant access to information for inpatient care
  – New intake (women’s health): 30-minute time reduction

• System Usability Scale
  – JLV (85.0), VistA Web (22.5)
  – EHR product average (78.13)
New “EHR” Product

• Enterprise Health Management Platform
  – General Architecture
  – Activity Management

• VHA priorities
  – How Activity Management provides value
eHMP Future State

- Third Party Applets (From FTL / Platform Users)
  - Advanced Team Communications / IM Capability
  - Voice Input

- Existing OpenSource / COTS Components

- New Modular Components: COTS / OpenSource
  - Event Driven Architecture
  - Services Enabled & Composable Components

- VA & External Rules Content
- COTS / OpenSource Components
- VA Custom Component
- VA Specific Interfaces

Workspace

- Allergies
- Medications
- Notes
- Vitals
- Labs
- Consults
- Non-eHMP Applet
- Non-eHMP Applet
- Non-eHMP Applet
- Workspace

UI/UX Framework

- Applet Repository

Composite Services

- CDS Engine
- Bus Rules Engine
- Team Mgmt.
- Population Health
- Semantic Engine
- Complex Events
- Orders Mgmt.
- Activity Mgmt.
- Statistics Engine
- NLP Engine

Data Layer

- Normalize
- Map
- Enrich

Authoritative Data

- RPC
- VistA
- JDS
- DAS
- DoD
Highlights of open eHMP

• Development Kits
  – Resources (RDK)
  – UX applets (SDK)
  – Available through Future Technologies Lab (FTL) (previously known as VHA Innovations VACI Sandbox)

• APIs
  – Representational State Transfer (REST)
  – Virtual Patient Record (VPR)
  – Fast Healthcare Interoperability Resources (FHIR) Draft Standard for Trial Use (DSTU)2 APIs
  – Working with standards development organizations and Health Services Platform Consortium on more
VHA Priorities

Access for Veterans
Employee Experience
Best Practices
High Performing Network
Restoration of Trust & Confidence
Model of Healthcare

**Patient Centric**
- Seamless
- Patient goals
- Dynamic demand management

**Team Based**
- Integrated plan of care
- Communication support
- User experience

**Quality Driven**
- Evidence-based standardized processes
- Feedback from analytical systems
- Cohort and population management
Key technical capabilities

• Explicit patient-tailored goals
• Activity management
  – Tasks
  – Teams roles
  – Rules
  – Workflows
  – Analytics
Human Tasks

Inactive

Created

Inactive

No actual owner required.
Register task with coordinator

Created

(activation || nomination performed) && (multiple potential owners || work queue)

Ready

Reserve

InProgress

Completed

Failed

Error

Exited

Obsolete

Suspension

Resume

Suspend

Start

Delegate

Claim || Delegate

Release || Forward

Completion with fault response
Send application fault

Completion with response
Send result

Non-recoverable error
Send "WS-HT fault"

WS-HT exit
Exit task

Skip && isSkippable
Send "WS-HT skipped"
Activity Management

• Key Characteristics
  – Closed loop tracked state including fail
  – Feedback to learning healthcare system

• Ordering Overlay
  – Intention & Request
  – Accept and Define
  – Execute
Access

- Current
  - I want to be seen in next few days for…
  - I’ll see you again in 6 months
  - A bunch of things happen
- Future
  - Protocols for various health concerns including social and behavioral determinants
  - Designed so every member of team is utilized to “top of license”
  - Care escalates as needs (goal deviation) increase or de-escalates and needs decrease
  - eHMP + scheduling optimizes resource matching + timing
  - We know what happens, can analyze it, and improve processes
Employee Experience-Alerts

• Current
  – Interrupt, overwhelm

• Future
  – Suggest activities by event/context driven CDS (intentions)
  – Task framework increases trust, eliminates FYI
  – User only sees notifications that require action or escalation based on goals and protocols
  – User sees notifications with sufficient context to quickly choose reasonable action
Consistency of Best Practice

• Current
  – Locally negotiated service level agreements
  – Can’t measure most practices

• Future
  – Explicit protocols and other workflow tools track work to goals
  – Commercial content
  – Rapidly update and disseminate protocols
  – Conduct experiments and analyze what is working
High Performing Networks

• Current
  – Measure time to complete care
  – Subjective quality control

• Future
  – Exchange semantically consistent data
  – Exchange machine readable protocols
  – Reconcile role and team structure
  – Track violations, lapses, outcomes population and individual
Benefits and Value of Health IT

Increase satisfaction by delivering high-quality and efficient Veteran-centric care.

**Example:** Proactive renewal of prescriptions ensures that a patient will always have access to the medications prescribed.

Decrease unnecessary duplicative testing and images for effective clinical decision support and treatment.

**Example:** eHMP will generate tasks such as handling abnormal test results and filter tasks for manifestation only if action is needed.

Increase secure electronic data transfer between all facilities including private sector providers.

**Example:** eHMP will use national standards to electronically encode and disseminate descriptive clinical information.

Increase patient engagement using population health management solutions and patient-driven goals based on Veteran’s preference and clinical needs.

**Example:** eHMP will send paper or electronic communication to patients regarding updates to their care plan, such as beneficial/adverse medication reactions.

Decrease expenditures by creating interoperable enhancements and open source platforms.

**Example:** Eliminate 60% of alerts saving an estimated 6,000 hours per week for outpatient settings; reduce prescription processing time.
Questions

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Visit Booth 10109 in the Federal Health IT Solutions Pavilion

DoD session later today

Thursday, March 3:
Achieving Interoperability with VA & Private Sector Partners: 2:30–3:30 PM