Conflict of Interest

Theresa Cullen, M.D., M.S. and Alan Constantian, Ph.D. have no real or apparent conflicts of interest to report.
### Acronym Soup

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AHLTA</td>
<td>Armed Forces Health Longitudinal Technology Application</td>
</tr>
<tr>
<td>CHCS</td>
<td>Composite Health Care System</td>
</tr>
<tr>
<td>DHMS</td>
<td>DoD Healthcare Management System</td>
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<tr>
<td>DoD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>iEHR</td>
<td>Integrated Electronic Health Record</td>
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<tr>
<td>IPO</td>
<td>Interagency Program Office</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<tr>
<td>OEF</td>
<td>Operation Enduring Freedom</td>
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<tr>
<td>OIF</td>
<td>Operation Iraqi Freedom</td>
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<tr>
<td>OND</td>
<td>Operation New Dawn</td>
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<tr>
<td>PACT</td>
<td>Patient Aligned Care Team</td>
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<tr>
<td>PCMH SHEP</td>
<td>Patient-Centered Medical Home Survey of Healthcare Experiences of Patients</td>
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<tr>
<td>PTSD</td>
<td>Post-Traumatic Stress Disorder</td>
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<tr>
<td>VA</td>
<td>Veterans Affairs</td>
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<tr>
<td>VHA</td>
<td>Veterans Health Administration</td>
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<tr>
<td>VistA</td>
<td>Veterans Health Information Systems and Technology Architecture</td>
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<tr>
<td>NDAA</td>
<td>National Defense Authorization Act</td>
</tr>
<tr>
<td>VLER</td>
<td>Virtual Lifetime Electronic Record</td>
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</table>
Purpose and Learning Objectives

Purpose

This session will discuss the current roadmap and goals for the VistA Evolution Program, as well as how this modernization effort is being managed. Lessons learned from the governance of the joint DoD/VA integrated Electronic Health Record program will be discussed, as will the resulting structure of the VA successor program, VistA Evolution. Program challenges and strategic choices will be identified.

Learning Objectives

1. Describe a vision for where VistA Evolution is headed over the next decade.
2. Recognize the key challenges and opportunities posed by EHR modernization.
3. Identify the VA's EHR priorities and critical health management functions.
4. Discuss successful strategies for managing an IT development initiative of this scope and complexity in the federal workspace, including governance, documents and processes.
The VA Enterprise Roadmap

Source: Department of Veterans Affairs, FY 2013-2015 Enterprise Roadmap, Office of Information and Technology, March 28, 2014
http://www.ea.oit.va.gov/docs/VA_Enterprise_Roadmap_2_FINAL_20140409.pdf
VA’s Mission Priorities

“We’ve taken actions to:

• Rebuild trust with Veterans and stakeholders.
• Improve our service delivery, with a focus on Veterans’ outcomes.
• And set a course for long-term excellence and reform.
  – Our first priority is to improve our performance. There’s a lot at stake: We deliver 240,000 episodes of care and do nearly 1100 surgical procedures—each day.
  – Second, it’s imperative that we re-set VA’s culture. We’re putting a high premium on our core values: Integrity, Commitment, Advocacy, Respect, and Excellence—taken together, I-CARE. They can go a long way in helping VA resolve the challenges before it.
  – And our third is to develop more efficient, transparent, accountable practices to support the care, services, and programs we deliver.

VA’s vision for change is Veteran-driven—from the 90-year-old GI who crossed Omaha Beach, to the 19-year-old Marine who battled insurgents in Afghanistan’s Korengal Valley of Death.”

Remarks by Deputy Secretary Sloan Gibson, November 4, 2014, Frederick, MD

VHA’s Goals and Objectives

• Provide Veterans personalized, proactive, patient-driven health care
  – VA Health Care Delivery, Communication, Awareness & Understanding, Access to Information & Resources, Quality & Equity, Innovation & Improvement, and Collaboration

• Achieve measurable improvements in health outcomes
  – Expectations and Incentives

• Align resources to deliver sustained value to Veterans
  – Support Services, Operational Processes, Resources, Agile Footprint, Capital Investments, IT Investments, Local Flexibility, and Leadership

Source: VHA Strategic Plan, FY2013-2018
VistA Evolution and VistA 4 Improve Healthcare to Veterans and Family Members

Care Coordination is patient-centric, team-based, quality-driven healthcare.

**PATIENT CENTRIC**

**Seamless care:** When a Veteran walks into clinic, his/her records from other clinics are available.

**Patient goals:** A Veteran can specify what is most important to her. VistA 4 will track how clinician and patient actions help realize those goals, so adjustments to the plan can be made early to speed realization of those goals.

**Dynamic demand management:** When data indicates a Veteran’s condition is unexpectedly worsening, VistA 4 will enable more resources to be applied sooner. Likewise, when Veteran’s conditions unexpectedly improves, appointments can be spaced further out, increasing convenience for the Veteran and freeing resources for other Veterans.

**TEAM BASED**

**Improved User Experience:** VistA 4 will give clinicians more efficient and effective tools that promote discussion (instead of data access and entry) in the exam room. This improves provider satisfaction and VHA’s ability to recruit clinicians.

**Integrated plan of care:** The cardiologist and the internist both operate from the same plan of care instead of from their separate (and possibly conflicting) notes. Veterans can also see the plan of care and their role in it.

**Improved communication:** Communication is action oriented, so it’s clear to clinicians what Veterans (or other clinicians) are asking them to do and the tasks can be tracked to completion.

**QUALITY DRIVEN**

**Better data on clinical management:** VistA 4 will automate more detailed gathering of clinical processes so managers and analysts learn what is beneficial, what is wasteful and how to encourage best practices (Lean-style management).

**Improved decision support:** Clinicians will have more information at their fingertips that guide better decisions about the plan of care.

**Support for managing populations:** Population-health analysts and managers will have data available to institute policy and procedures for managing the health of populations that address proactive healthcare interventions. Interventions could address immunizations, obesity, appropriate antibiotic use, etc.
Caring for Veterans

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

60% Private Sector Care
A significant percentage of the Veteran population receives some or all of their care in the private sector

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

Source: Department of Veterans Affairs, National Center for Veterans Analysis and Statistics. Updated Feb 19, 2015; VHA website.
## VistA Evolution Landscape

### Health Care for Veterans is Evolving
- **Medical science** is advancing beyond VistA's capacity to handle the volume and domains of decision support needed for modern care.
- **Veteran care needs** are changing with increased survival of physically and mentally traumatic injuries, requiring intense coordination among provider teams.
- **Models of healthcare** delivery are changing to be patient-centric, team-based, and quality driven.
- **Structure of VA healthcare** is changing with more care occurring outside VA – this care needs to be coordinated and monitored for quality.

### VA is Committed to Open Architecture
- Under FOIA, VistA has always been available from VA as **public domain software**.
- As an Open Source EHR, VistA allows for **patient ownership of health records**, not vendor ownership.
- Easier sharing of patient records and health data with other providers allowing for **greater interoperability**.
- Open source software provides for **flexible capabilities** due to local optimization and broad collaboration.
- **APIs** allow for open architecture.

### Clinicians Like VistA but Want More
- In one study – Clinicians rate VistA/CPRS as one of the **best EHRs available today**: top ranked in a 2014 survey of 18 EHRs *
- Clinicians throughout the VA provided **feedback on capabilities and functionalities** that should be included in a modernized VistA; providers and care teams want a **future-proofed EHR** that easily integrates updates and remains **state-of-the-market**.

Why VistA Evolution is Important

Caring for Veterans is more complex than ever

- Improvements in battlefield medicine and technology have helped more Servicemembers survive combat injuries in OEF/OIF/OND operations than in any past period of conflict for the United States.
- More Veterans have complex, challenging injuries including polytrauma, traumatic brain injuries, and PTSD, requiring multiple specialists to work together providing care.
- The number of women Veterans continues to rise dramatically, and VA must improve tools and resources to support women’s health.
Why VistA Evolution is Important

Caring for Veterans today requires Teams working together

• VistA must evolve to support Care Teams working together, rather than individual providers at a single site
• Providers need tools to coordinate Care Team tasks, find information quickly, and see a Veteran's complete health history at any time, in any place, on any device

Veterans are part of the Care Team

• Veterans' goals and preferences are critical to successful outcomes and maximizing wellness. VistA Evolution will provide tools for including Veterans in Care Team decisions and actions
A Key Performance Indicator (KPI) is a high level indicator to demonstrate how effectively VistA is achieving key strategic goals, like (1) Improvement in veteran health, (2) Improvement in veteran access, and (3) Reduction in the cost of healthcare services.

In the process of KPI development, including Impact and Technical Metrics, we:

1. **Derive KPIs** from the VHA strategic Goals and main Objectives.

2. Use the KPIs to **identify the needed capabilities** in the VistA Evolution program and associated system design.

3. **Develop metrics** that address needed capabilities in the VE program as defined in the VistA 4 Roadmap.

4. Develop a **measurement plan** to determine that the KPIs are actually being met/accomplished.
## VistA Evolution Key Performance Indicators

Following the aforementioned methodology, the following KPIs have been identified:

<table>
<thead>
<tr>
<th>KPI 1</th>
<th>Improve Access to Care</th>
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<tbody>
<tr>
<td>KPI 2</td>
<td>Improve Care Coordination</td>
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<tr>
<td>KPI 3</td>
<td>Improve Resource Utilization within the VA Care Delivery Cycle</td>
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<tr>
<td>KPI 4</td>
<td>Improve Patient Outcomes through improved medication list accuracy</td>
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<tr>
<td>KPI 5</td>
<td>Improve clinical decision making</td>
</tr>
<tr>
<td>KPI 6</td>
<td>Increase Quality and Quantity of Medical History Data Available to Support Clinical Decision Making</td>
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<tr>
<td>KPI 7</td>
<td>Improve Resource Utilization Metrics in Patients who receive care Outside the VA</td>
</tr>
<tr>
<td>KPI 8</td>
<td>Increased health of populations through appropriate utilization of population health data</td>
</tr>
<tr>
<td>KPI 9</td>
<td>Shorten Time to Delivery of New HIT Functionality</td>
</tr>
</tbody>
</table>
| KPI 10 | Improve User Satisfaction with the Electronic Health Record  
  A. Through Improved Clinical Features  
  B. Through Improved IT Performance |
VistA Evolution Key Performance Indicators linked to VHA Strategic Goals

VA Strategic Goals

- **Strategic Goal 1:** Empower Veterans to Improve Their Well-being
- **Strategic Goal 2:** Enhance and Develop Trusted Partnerships
- **Strategic Goal 3:** Manage and Improve VA Operations to Deliver Seamless and Integrated Support

| KPI 1 | Improve Access to Care |
| KPI 2 | Improve Care Coordination |
| KPI 3 | Improve Resource Utilization within the VA Care Delivery Cycle |
| KPI 4 | Improve Patient Outcomes through Improved Medication List Accuracy |
| KPI 5 | Improve Clinical Decision Making |
| KPI 6 | Increase Quality and Quantity of Medical History Data Available to Support Clinical Decision Making |
| KPI 7 | Improve Resource Utilization Metrics in Patients who receive care Outside the VA |
| KPI 8 | Increased health of populations through appropriate utilization of population health data |
| KPI 9 | Shorten Time to Delivery of New HIT Functionality |
| KPI 10 | Improve User Satisfaction with the Electronic Health Record |
Exemplar of KPIs

KPI 6: Increase Quality and Quantity of Medical History Data Available to Support Clinical Decision Making

Metrics:

• Number of different categories of data that are viewable in an integrated display, from sources inside & outside of the VA

• PCMH SHEP score Q23 (In the last 12 months, how often did this provider seem to know the important information about your medical history?)

• Number of inpatient admissions inside & outside the VA by PACT team, related to frequency with which outside data is reviewed in a given PACT team
DoD/VA EHR Strategy Evolution

Based on an independent analysis of alternatives DoD determined an off-the-shelf acquisition would meet their requirements and achieve savings. VA determined the most cost effective approach to meet their requirements was evolving VistA. Interoperability between the Departments remains a core requirement for the two modernization efforts.

Former Strategy: iEHR
Best of Breed Solution
- Single system deployed by each department
- Required substantial development and integration
- Multiple contract awards based on individual capabilities
- 54 separate capability programs managed across six overlapping increments
- Separate tactical and garrison EHR solutions

Current Strategy: DHMSM
Hybrid, Best of Suite Solution
- Less integration required than best of breed
- Single award, multi-year contract
- Enterprise health record that includes operational requirements
- Much larger scope, but less complex management effort than former approach

Current Strategy: VistA Evolution
Modernize VistA
- VistA Evolution is based on open standard/open source VA Architecture, leveraging successful VA legacy systems to move to the future
- Provides a complete picture of a Veteran’s health history
- Addresses interoperability with DoD and with third parties
- Provides tools VA does not have today to support team-based, patient-centric, quality-driven care
# VistA Evolution Approach Analysis

<table>
<thead>
<tr>
<th></th>
<th><strong>Open Source VistA</strong></th>
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</table>
| **Total Cost of Ownership** | Low implementation costs for gradual, incremental transition  
Low data integration costs, as VA uses existing database  
Moderate costs for adding new capability, as VA pays for incremental capabilities vs. a completely new system                                                                 |
| **Risk of capability acquisition** | Low for working with open-source community to modernize existing core functionality  
Moderate for functionality not part of code base, as open architecture and standards designed to accept code and content from other systems                                                                 |
| **Interoperability with other EHRs** | Moderate to High: On track for interoperability targets for 2016, will incorporate industry leading capability                                                                                                           |
| **Return on investment**    | High and early: Capability is delivered incrementally starting in 2014. Investment is focused on provision of new functionality in support of Veteran-centric, team-based, quality-driven healthcare for high-morbidity conditions prevalent in Veterans but not rest of US population |
| **User satisfaction**       | Moderate to High: Builds on current success of clinician preferred design (2014 survey). Extends capabilities with evidence-based approaches for improved efficiency, accuracy, and satisfaction                                                                                                                                 |

Collaboration with innovators is currently ongoing through multiple outreach efforts with the open source community: Open Source Electronic Health Record Alliance and VistA Intake Program
VistA Evolution Value Targets

**Care Coordination**
- Care plans that are the central feature of patient record, not an afterthought
- Reduces duplications and errors
- Patient goals that make it clear to clinicians what patients value and allow measurement of clinician success/productivity
- Supports lean-style management of clinical microprocesses

**Interoperability**
- Provides more seamless care experience
- Enables more efficient clinical workflows
- Closes information gaps
- Reduces duplicate tests
- ePrescribing
- Recaptures data from non-VA care settings

**Improved UX**
- Increases clinical care team productivity and satisfaction
- Improved efficiency – better access
- Optimized software features
- Better integration with workflow
- More cognitively and ergonomically efficient to use
- Reduced task errors
- Easier to learn and remember

**Medical Device Integration**
- Collects and transmits data to the EHR
- Enhances analytics and quality of care
- Optimizes telehealth capabilities
- Shortens length of stay

**Investments and Capabilities Providing Benefits for Veterans**
# KPIs and Value Targets

## Care Coordination

| KPI #2 | Improve Care Coordination |

## Interoperability

| KPI #6 | Increase Quality and Quantity of Medical History Data Available to Support Clinical Decision Making |

## Improved UX

| KPI #10 | Improve User Satisfaction with the Electronic Health Record |

## Medical Device Integration

| KPI #6 | Increase Quality and Quantity of Medical History Data Available to Support Clinical Decision Making |
VistA: Time, Productivity & Satisfaction

• How much time do physicians lose to EHRs?
• On average, 78 minutes a day or 6.5 hours per week. If a clinic workday is 8 hours, the surveyed physicians were spending nearly a full extra day every week. Some EHRs took much longer and others took less time.
• The EHR that took the least amount of time was VA VistA, which averaged about 20 minutes per day and 100 minutes per week—80 percent less than the overall average of 6.5 hours.
• Think about it. How much more would your level of job dissatisfaction rise if technological change added 78 minutes to your day versus 20?

VA Approach to User Adoption

• No two implementations are alike.
  – Each facility has a different culture, set of priorities, and infrastructure. Therefore careful time and consideration must be put into each implementation. Involve local clinical champions.

• The benefits of the solution must be known to all stakeholders.
  – Clear clinical goals must be articulated and agreed to before implementation can begin. Valued products must solve real problems faced by users.

• Business processes must be reengineered with input from users, before automation.
  – Expect that productivity will decrease during the early phases of implementation as users become acclimated to new processes. Collaborate with clinicians and VHA staff throughout the SDLC.

• Leadership matters.
  – Others’ experience implementing technology is similar. They learned early testing is a must, be prepared for service disruptions, organizational culture and leadership support are key to success, and productivity will decrease initially. VHA leadership must support and endorse vocally at multiple levels.
Vista 4 Product Road Map

**FY2014**
- Initial Operating Capabilities
  - VA/DoD Information Sharing (via Joint Legacy Viewer)
  - VistA Standardization, Phase 1
  - Back-end Immunization Module, VistA Immunization Enhancements (VIMM), 1.0
  - Identified release of Application Programming Interface (API) to expose a set of VistA services via standard web interfaces
  - Graphical User Interface (GUI) Tools
  - Initiate Lab System Improvement
  - Enterprise Messaging Infrastructure (eMI)

**FY2015**
- Improved Infrastructure and Clinical Enhancements
  - Interoperability Enhancements including better integration of codified DoD data
  - Deployment of view-only Enterprise Health Management Platform (eHMP)
  - Clinical improvements for Patient-safety, Decision Support, Communication, and Population Health
  - VistA Scheduling: deployed enhancements to legacy systems and begin acquisition of new functionalities

**CY2016**
- Interoperability and Veteran-Centric Capabilities
  - Meaningful, real-time exchange of information with DoD and external providers
  - Enterprise-wide deployment of eHMP
  - Additional clinical functionality to include patient goals, enhancements to pharmacy
  - Continued VistA Scheduling development and deployment
  - VistA core technology modernizations.
  - Modular ONC certification

**FY2017**
- Team-based and Quality Management Capabilities
  - Care-reconciliation capabilities for improved interoperability
  - eHMP begins to replace legacy systems
  - Additional clinical improvements for patient-centered care plans and improved communication tools
  - Complete VistA Scheduling deployment for the core capabilities
  - VistA core technology modernization including database and messaging systems
  - Modular ONC certification

**FY2018**
- Care coordination and Lean management capabilities
  - Delivery of all new VistA 4 capabilities
  - Retirement of CPRS
  - Additional capabilities for care coordination, quality management, specialty care, and ancillary systems
  - Clinical integration of scheduling capabilities and resource management
  - Further VistA core technology modernization for decision support.

Legend:
- Blue: Complete
- Green: On Track
- Yellow: Deployment Slip
- Red: High Risk

* CY16 Due to 2014 NDAA Sec. 713 treatment.
Interested in learning more?

Dr. Jonathan Nebeker and Dr. Aaron Drew will present

VistA Evolution Interoperability Roadmap and Initiatives

This session will discuss the VistA Evolution roadmap, timelines, milestones and initiatives, including the transformative new Enterprise Health Management Platform (eHMP) and the robust user experience it is designed to deliver. Discover how the first open source EHR is adapting to meet the current and future needs of Veterans and providers.

Wednesday, April 15th from 2:30 – 3:30 in Room S102
Questions

• Dr. Theresa Cullen
• Theresa.Cullen@va.gov

• Dr. Alan Constantian
• Alan.Constantian@va.gov
Backup Slides
Veterans Health Information Exchange

Veterans Health Administration (VHA) uses multiple means of health information exchange which emphasize the importance of information flow – information moving from provider to patient, patient to provider, and between providers.

- **Virtual Lifetime Electronic Record (VLER) Health Exchange** – Allows VA and non-VA providers to request and share Veterans’ health information from each other’s organizations

- **VLER Health Direct** – Allows one VA provider to send specific information to one non-VA provider (point-to-point) via email

- **Regional Health Information Exchange (RHIE)** – Represents community health information exchanges, repository portals, and other local use cases.

- **Veteran-initiated HIE (2015)** - Veterans sending their health summary downloaded with Blue Button from My HealtheVet via VA Direct to their non-VA clinicians
Exchange Partners – Nationwide

Current Partners Connected to:

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Clinics</th>
<th>Hospitals Owned Practices</th>
<th>Labs</th>
<th>Pharmacies</th>
<th>Nursing Homes</th>
<th>Other Ancillary Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>469</td>
<td>12,067</td>
<td>1,974</td>
<td>111</td>
<td>67</td>
<td>100</td>
<td>315</td>
</tr>
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VA Direct HISP Partners in Production
As of April 1, 2015

HISP: North Dakota HIN (NDHIN) - Orion
HISP: Iowa Health Information Network (IHIN) - ICA
HISP: Community Health Information Collaborative (CHIC) - Inpriva
HISP: Upper Peninsula Health Information Exchange (UPHIE) - ICA
Partner: Rhode Island Quality Institute (RIQI) - Inpriva
HISP: Kansas Health Information Network (KHIN) - ICA
HISP: Utah Health Information Network (UHIN) - SES
HISP: Alaska eHealth Network (AeHN) - Orion
HISP: Missouri Health Connection (MHC) - Inpriva
HISP: Florida HIE - Inpriva
HISP: North Carolina HIE - Orion
May 2015 - Estimated completion date for DirectTrust accreditation as a Health Information Service Provider (HISP)

HISPs
1. UHIN (SES)
2. AeHN (Orion)
3. MHC (Inpriva)
4. CHIC (Inpriva)
5. Florida HIE (Inpriva)
6. NCHIE (Orion)
7. Hixny
8. Iowa HIE (ICA)
9. KHIN (ICA)
10. UPHIE (ICA)
11. NDHIN (Orion)
12. Hawaii HIE (Medicity)
13. IHS
14. Surescripts
15. Inpriva