A Clinician’s Perspective on Health IT at the VA

featuring

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VA Organization

Department of Veterans Affairs (VA)

Veteran’s Benefits Administration (VBA)
Veteran’s Health Administration (VHA)
National Cemetery Administration (NCA)

Courtesy of Kevin Meldrum
VHA Facilities

• 163 Hospitals
• 800 Clinics
• 135 Nursing Homes
• 43 Domiciliaries
• 180,000 Healthcare Professionals

• Serving 6 Million Veterans per Year
• Hospital sizes vary from 100 to 1000 beds.
• Outpatient visits vary at each facility from 30,000 to 450,000 visits per year
• 46.5 million outpatient visits per year
• 564,000 inpatient admissions per year
• 167 million prescription-months filled
VistA:
In Every VA Medical Center For >15 years!
2006 – Innovation Award for VistA
VA’s Electronic Health Record (EHR)
• The VA’s EMR been estimated to improve efficiency by 6% per year
• Pharmacy prescription accuracy has improved to 99.997%
• VA hospitals only 1/13 systems that have achieved HIMSS stage 7, the highest level of record integration
• Public domain software available through the freedom of information act directly from the VA’s website or network of distributors
History of VistA

• 1977 – 1981 “The Underground”
• 1980s – Service Focused Software
• 1990s – Physician Focused Software
• 1997 – Release of Computerized Patient Record System (CPRS)
• www.hardhats.org

Courtesy of Kevin Meldrum
Database

• Developed using M or MUMPS language/database
  – Runs on InterSystems Cache version of MUMPS
  – Open source engine called GT.M for Linux and Unix computers is available
VistA: A Chart Metaphor Combining Text and Images

Single longitudinal health record is immediately available in:
- Outpatient
- Inpatient &
- Long-term care settings
VistA Imaging

- Integrates images with the electronic medical record
- Can be used independently or integrated into VistA
- Includes
  - Radiology
  - EKG’s
  - Pathology
  - GI lab
  - Dermatology
  - Wound Care
  - Scanned Documents
In The Beginning

NIST (Then NBS) was asked to turn the existing systems-technology strategy into a systems-architecture design

Dr. John Chase, the VA’s Medical Director agreed to deploy the system at the VA Hospitals

Dr. Robert Kolodner (later the National Health Information Technology Coordinator) and George Timson were involved since 1977

– 1978 - Minicomputers sent to about 20 VA Medical Centers

– 1979 - “Underground Railroad” formed referred to as conspirators against the enemy
DHCP - Hospital Information System – 1981

Congressman Sunny Montgomery arranged for DHCP to be written into law as a program at the VA

- 1982 - Official deployment of core applications
- 1993 - Order Entry / Results Reporting

The four major adopters of VistA (VA, DoD, HIS, and the Finnish Consortium) each took VistA in a slightly different direction

The Finns actually were the first major adopter
VistA

Electronic Health Record (EHR) – The name was adopted in 1994 under Ken Kizer

– 1996-99 - CPRS (“Clinical Desktop”)
– 2000 - Bar Code Medication Administration

– 2004 – My HealtheVet (Personal Health Record – PHR)
– 2010 – Blue Button (Data Download)
Bar Code Medication Administration (BCMA)

- Virtually Eliminates Errors at the Point of Administration

BCMA Assures the:
- Right Medication
- Right Dose
- Right Patient
- Right Provider
- Right Time
Largest telehealth program in the world

60,000 veterans received telehealth services in 2011
VA Provides My HealthVet: A Personal Health Record For Veterans

My HealthVet
URAC Award for Best Practices in Consumer Empowerment and Protection

March 26, 2008
Welcome to My HealtheVet

My HealtheVet is VA's online personal health record. It was designed for Veterans, active duty Servicemembers, their dependents and caregivers. My HealtheVet helps you partner with your health care team. It provides you opportunities and tools to make informed decisions and manage your health care.

Specific features in My HealtheVet are available to you based on your account type. All users who have a Basic account are able to view their self-entered information. If you are a VA patient, you can upgrade your account to Advanced or Premium. For more information about account types and what you can view, visit My HealtheVet Account Types.

Among the newest features available to Veterans with a Premium Account include VA Notes. These are clinical notes that your health care team records during your appointments or hospital stays. Also available are your VA Immunization records, more detailed lab reports and a list of your current medical issues. These features are in addition to prescription refills, VA Appointments and Secure Messaging – all very popular with Veterans!
“For the first time ever, veterans will be able to go to the VA website, click a simple Blue Button and download or print your personal health records so you have them and can share with your doctor outside of the VA.” —President Barack Obama
Download Your Own VA Medical Records

Think of all the times you've sat in the doctor's office, trying to remember what year you had surgery or the name of that hard-to-pronounce prescription you're taking. Or maybe you have difficulty keeping track of your appointments or how stable your blood sugar levels have been lately.

Stay on top of managing your health by using My HealtheVet's Blue Button feature. It allows you to view, print, or download and store information from your personal health record (PHR). Then everything is all in one place and viewable whenever you need.

By organizing and accessing your medical records, the VA Blue Button helps you better manage your health care needs and communicate with your health care team. With the Blue Button, you can download your PHR and share it with your VA and non-VA providers. This helps them get the big picture of your health and inform them how you're doing in reaching your treatment goals. You can download your record either as a PDF, text file or customizable Blue Button file. You select the date range and the categories of information you wish to include. Print out information to file away at home, take a copy to your next appointment or send an electronic version of your self-entered information in a Secure Message to your VA health care team.

Start building your PHR by self-entering your personal information, such as your health history, emergency contacts and medications. You can monitor your vital signs and use the journals to track your diet and physical activity. Even if you're not a Veteran, you can take advantage of this convenient way to organize your information.

Then when you click the VA Blue Button, you can view all the data! If you're a Veteran who receives care from VA, you can set your preferences so that some VA and/or DoD records feed into your VA Blue Button copy of your PHR, such as your military service information. Your downloadable PHR can show you:

- Information for emergency contacts, health care teams and insurance providers
- Over-the-counter medications, allergies, military health history, medical events and lab tests
- Daily records in your diet and physical activity (exercise) journals
- Recorded Vitals & Readings (blood pressure, blood sugar, cholesterol, heart rate, body temperature, weight, pain level, etc.)

My HealtheVet users who are registered as a "VA Patient" can also see:

- Military service information from your VA and/or DoD records
- Prescription history.

VA patients: you can make your PHR even more beneficial by upgrading to a Premium Account. This level gives you full access to My HealtheVet features, including Secure Messaging with your VA health care team. When you download your data with the VA Blue Button, you can also view information that VA/DoD has added into your health record, such as:

- VA Chemistry/Hematology/Microbiology Lab results – the results from your lab tests
- Information on your VA Appointments – the details of recent and future appointments at VA medical centers and/or CBOCs
- VA Immunizations – a history of the immunizations you have received through VA
- VA Problem List – a list of your active health conditions and symptoms
- VA Notes – the clinical notes that your health care team records during your appointments or hospital stays
- VA Admissions and Discharges including discharge summaries – a list of admissions and discharges plus the detailed summary documented by your health care provider when you were discharged from the hospital

To get this type of account you need to go through Authentication* to verify your identity and have your My HealtheVet profile information linked to VA/DoD records.

A number of smartphone apps are also available through a variety of non-VA sources. While VA doesn't endorse specific apps, there are now creative, secure and easy-to-use ways of viewing Blue Button data. Search for "Blue Button" in your smartphone apps library to learn more.
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Blue Button Apps Competition
## VISTA Layered Approach

- **CPRS Graphical User Interface**
  - **VistA Health Systems**
    - OE/RR
    - Text Integration
    - Imaging
    - Consults
    - Clinical Reminders
  - **VistA Core Packages**
    - A/D/T
    - Laboratory
    - Pharmacy
    - Radiology
    - Dietetics
    - Billing
    - Nursing
    - Appt Mgt
    - Enrollment
    - Etc.
  - **VistA Kernel**
    - Menu Tree
    - Access & Privileges
    - Data Dictionary
    - Job Scheduler
    - Messaging
  - **MUMPS**
    - MUMPS Processes
    - MUMPS Data

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**Courtesy of Kevin Meldrum**
CPRS Demo

Try VA’s VistA CPRS software today!

You can download VA's award winning electronic health record software CPRS (Computerized Patient Record System) by following the instructions for installing the client software below.

- **Download** the latest version of CPRS today and get access to new features including graphing functionality
- **Use** the software as if you were a provider by entering orders, entering documentation, retrieving reports (and graphs) and viewing alerts and notifications that help with decision support
- **Learn** first hand how VA’s electronic health record system works

http://www.ehealth.va.gov/EHEALTH/CPRS_Demo.asp
### Active Problems
- Depression
- Allergic Rhinitis
- Hypertension
- Osteoarthritis

### Allergies / Adverse Reactions
- No Known Allergies

### Active Medications
- Citalopram Hydrobromide 20mg Tab
- Lisinopril 20mg Tab
- Hydrochlorothiazide 12.5mg Tab
- Acetaminophen 500mg Tab
- Aspirin 81mg Ec Tab
- Chondroitin/Glucosamine Cap/Tab
- Fluticasone Furo 27.5mcg 120d Nasal Inhl
- Cetirizine

### Clinical Reminders
- Hepatitis C risk Factor Screening: DUE NOW
- Primary Care Depression Screening: DUE NOW
- Hypertension: DUE NOW
- SUICIDE HOTLINE: DUE NOW

### Recent Lab Results
- **Cholesterol Blood Serum Wc Lb #17900 Oct 31,11**
  - T: 99.2 F
  - P: 75
  - R: 15
  - BP: 127/82
  - HT: 68 in
  - W/T: 175 lb
  - POX: 93
  - BMI: 26.6

### Vitals
- **T**: Jul 01,2010 14:00 (37.3 C)
- **P**: Jul 01,2010 14:00
- **R**: Jul 01,2010 14:00
- **BP**: Jul 01,2010 14:00
- **HT**: May 14,2010 14:00 (172.7 cm)
- **W/T**: Jul 01,2010 14:00 (79.4 kg)
- **POX**: Jul 01,2010 14:00
- **BMI**: Jul 01,2010 14:00

### Appointments/Visits/Admissions
- **Feb 21,12 08:00**: Cardiology Action Required
- **Dec 25,11 08:00**: Primary Care Action Required

### Footer
Cover Sheet | Problems | Meds | Orders | Notes | Consults | Surgery | D/C Summ | Labs | Reports
Visit: 07/01/10 PRIMARY CARE GENERAL NOTE, GENERAL MEDICINE, ONE PROVIDER (Jul 01,10@13:00)

LOCAL TITLE: PRIMARY CARE GENERAL NOTE
STANDARD TITLE: PRIMARY CARE NOTE
DATE OF NOTE: JUL 01, 2010@13:00    ENTRY DATE: MAR 01, 2011@09:22:19

AUTHOR: PROVIDER,ONE    EXP COSIGNER:
URGENCY:    STATUS: COMPLETED

CC
F/U Depression and lab work.

Subjective
The patient went by the lab this morning and got the labs ordered for today.

Depression
The patient indicates that his symptoms have improved significantly, but not as much as he expected. He is still sleeping a lot (about 12 hours per day) and finds it hard to concentrate on looking for work. He is eating better and has gained a few pounds. He denies suicidal ideation. His PHQ-9 score is 16 today.

Allergies
NKDA

PMH
Depression
Hypertension
Allergic rhinitis
Acute sinusitis
Osteoarthritis

PSurgHx
None

FamHx
Mother died of MI at 64 years of age.
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<th>Outpatient Medications</th>
<th>Expires</th>
<th>Status</th>
<th>Last Filled</th>
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<td>May 07,11</td>
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<td>2</td>
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<td>Chondroitin/Glucosamine Cap/Tab Qty: 90 for 30 days Sig: 2 TABLETS MOUTH EVERY 8 HOURS</td>
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<td>10</td>
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<td>Fluticasone Furo 27.5MG 1200 NASAL INHL Qty: 50 for 90 days Sig: SPRAY 2 SPRAYS IN MOUTH EVERY DAY</td>
<td>05/01/12</td>
<td>Active</td>
<td>Apr 15,08</td>
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</thead>
</table>

Cover Sheet | Problems | Meds | Orders | Notes | Consults | Surgery | D/C Summ | Labs | Reports |
Lessons Learned

User Involvement is ESSENTIAL

- Discover major innovations by front line users/developers
- Learn from the “Positive Deviants”
- Start with the Early Adopters
- Include users at all stages
Major Innovations from Local Users

Bar Code Medication Administration (BCMA)

• 1992 - the idea of Sue Kinnick, RN – a Nurse at the VA Medical Center in Topeka, Kansas

• VA wide by 2000

• Now going nationwide in U.S.

• How many lives saved and adverse outcomes avoided?
The current lookup site is New Orleans, LA.

To lookup a patient in a different site, choose from the list on the left.

If you don't see a list of sites in the control panel you are constrained to selecting patients only in the site at which you logged on. You will still get data from everywhere in VHA however.

If you need to do remote site patient lookups, you must contact your local Information Security Officer (ISO) and identify which sites you need to access and why you need the access.

Look for: 

Matches:
VistAWeb Overview

• Intranet web application used to view remote patient information found in VistA, Department of Defense (DoD) and the Health Data Repository (HDR) databases.

• Alternative to CPRS Remote Data View (RDV)

• Queries the Health Data Repository (HDR)
  – access to patient clinical data residing in the HDR-Interim Messaging Solution (IMS) and HDR-Historical
  – Allergies, Vitals, Outpatient Pharmacy

• VistaWeb servers and software are maintained in Silver Spring, MD.
History

• Initially developed as “class III” (home grown) software in Ann Arbor (VISN 11)

• Converted to nationally supported “class I” software and released in Spring of 2005
Ways to Access VistAWeb

- Remote Data Button in CPRS
- CPRS Tools Menu
- Standalone webpage (URL) – example next slide
VistaWeb Access via website

In Internet Explorer enter https://vistaweb.med.va.gov/

Select your VISN and then your VAMC “site”

Then…. Enter your ACCESS/VERIFY Codes
1996 – Test Site for CPRS at the VA Medical Center in Seattle, WA
VA’s Clinicians:

"Have Clinical Decision Support alerts/reminders fit OUR workflow."
Transition in the 90’s

• Major challenges included
  – Required physician entry of data but majority of physicians did not know how to type
  – Brought focus away from the patient and to the terminal/workstation and room design and ergonomics were such that this meant looking away from the patient
Major Challenges

– Performance was slow and became increasingly slow until much additional hardware was thrown at the system

– Training was a major challenge because of the limited hours available for physicians to be trained on the system

– Difficulty with the transition from paper to the electronic record; for a period of time needed to have information from both systems
– Additional versions came out quickly and it was difficult to keep up
– Lack of ability to provide feedback for specific issues except at a national level and prioritization was done nationally
– IT (IRM) became a vendor for PACS using VistA imaging and ended up competing with commercial systems and this made them slow to interface to commercial systems

  • System plays relatively poorly with third party systems

  • Would very much like to have an API to be able to have software find information within the system

– Database very unfriendly to perform searches for information
– Sign on process very slow and requires sign-in at workstation as a windows user and then sign in to CPRS which required separate processes and then another sign in to use the VistA imaging system

• Users would not sign-out and this created security issues

• Could take 5 minutes to sign in and sign out and major issue when going from room to room
– Despite national system no standards for how progress notes, radiology codes, and other things are coded and so difficult to share data

– Despite many efforts, difficult to transfer information from one VA hospital to another especially across VISN’s and ability to share information between VA and DoD surprisingly constrained with no real ability to share images

– VA imaging was one of the last systems to utilize DICOM standard and was based on pathology TIFF solution
What Was Really Good About VA’s VISTA

- CPRS Windows interface made access and searching for information easy and patient information was ubiquitously available throughout the enterprise
- Ability to plot laboratory data made it much easier to do trend analysis
- Chart metaphor made it easier for physicians, nurses, etc. to make transition from paper chart to EMR
• Images from all modalities including pathology, dermatology, ophthalmology, GI lab, OR, medical documents in addition to just radiology and nuclear medicine

• All healthcare providers were mandated to use VISTA and to do physician/provider order entry
  – Transcription was supported for a brief period of time for attending physicians only but this was eventually phased out
  – This was easier because the majority of progress notes in the VA were written by residents and fellows rather than VA attending physicians.
Intelligent System

• System does not incorporate intelligence I would like to see in 2013 system
  – Spell and grammar checker
  – System doesn’t learn from my habits and acts as though it is meeting me for the first time each time
  – System doesn’t allow me to search and list a subset of my patients
- System organized like paper chart with extremely limited search capability within a single patient and none across multiple patients
  - Can not search within a patient’s record for information easily; later versions had primitive text search but was very difficult to find instances, say of rash in a patient
- Clinical alerts/reminders information overload with minimal intelligence with regard to presentation and ordering of these.
- No good messaging system but instead requires users to sign onto VistA but physicians rotate in and out from University of Maryland.
Issues

- Radiology package old terminal emulator and little done to enhance
- Alert fatigue, alerts not presented in intelligent manner
- System does not recognize or learn from me
- Not well integrated with third party software and difficult to add additional 3rd party software
• Look into core measures monitoring but seems limited and little in the way of decision support for diagnosis or treatment
• Sign in and sign out difficult
• Can’t really search within or among different patient records to find similar patient
• Things such as pain not in the system
• Different ways progress notes, radiology studies, etc named across the system
• Designed like chart not optimized to be smart and searchable and intelligent and specific to needs of the user
• VISTA does a great job monitoring performance retrospectively:
  – Patients whose BP is within parameters
  – Counseling given for smoking cessation
  – Diabetics given tests for diabetic retinopathy

• However next generation systems should assist in diagnostic and treatment options in a real time fashion