FROM THE BEDSIDE TO THE ENTERPRISE – LEADERSHIP LESSONS FROM THE LARGE SCALE SUCCESS AT THE U.S. DEPARTMENT OF VETERANS AFFAIRS (VA)

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29 May 2011
HIMSS Middle East 11 Leadership Summit

HISTORY OF KEY VHA EHEALTH ADVANCEMENTS

NATIONAL DEPLOYMENT

DHCP - Hospital Information System
• 1982 - Official deployment of core components
  • Patient Registration; Admission/Discharge/Transfer; Clinic Scheduling
  • Laboratory; Outpatient Pharmacy
• 1991 – Health Summary – for use by front-line clinicians
• 1992 - VistA Imaging
• 1994 - Order Entry / Results Reporting

VistA – Electronic Health Record (EHR)
• 1996-99 - CPRS (“GUI EHR” for clinicians)
• 2000 - Bar Code Medication Administration (BCMA)

Personal Health Record (PHR)
• 2004 - My HealtheVet (PHR) – for use by patients
To Care for Him Who Shall Have Borne the Battle, and for His Widow, and His Orphan . . .

. . . Abraham Lincoln
DEPARTMENT OF VETERANS AFFAIRS

- 3 Main Divisions –
  - Benefits, Health, memorial Services
- Veterans Health Administration
  - Deliver health care to eligible veterans
  - Education / training health care professionals
  - Research
  - Backup to Department of Defense & Homeland Security
  - Homeless veterans
VA PATIENT CHARACTERISTICS

Patients

- 8.3 M enrollees
  - 6.0 Million patient treated annually
    - 62.3 Million outpatient visits
    - 589,000 admissions
  - Older, sicker, poorer

VA HEALTH FACILITIES AND BUDGET

Facilities

- Almost 1500 sites of care
  - 152 Hospitals
  - 919 Clinics
  - 183 Long-term care settings

Personnel

- 250,000 employees
  - 14,000 doctors
  - 115,000 health care professionals rotate or work in VA

Annual Budget

- $52 Billion
PNEUMOCOCCAL VACCINATION RATES IN VHA

Pneumococcal Vaccination Rates in VHA

- Iowa: Petersen, Med Care 1999;37:502-9. >65/ch dz
- HHS: National Health Interview Survey, >64

PNEUMONIA: ACUTE INPATIENT

DRG89-90; Unadjusted for Pt. Population (up 20%, FY99-01)
Improving Efficiency by Reducing Excess Health Care Utilization

9,500 fewer bed days
8,000 fewer discharges
### Prevention Measures

**Clinical Metrics Meet or Exceed Private Sector**

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<tbody>
<tr>
<td>Breast Cancer Screening</td>
<td>87%</td>
<td>86%</td>
<td>69%</td>
<td>67%</td>
<td>50%</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>92%</td>
<td>91%</td>
<td>82%</td>
<td>n/a</td>
<td>65%</td>
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<tr>
<td>Colorectal Cancer Screening</td>
<td>79%</td>
<td>78%</td>
<td>56%</td>
<td>50%</td>
<td>n/a</td>
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<tr>
<td>LDL Cholesterol&lt; 100 after AMI, PTCA, CABG</td>
<td>66%</td>
<td>62%</td>
<td>59%</td>
<td>56%</td>
<td>38%</td>
</tr>
<tr>
<td>Smoking Cessation Counseling</td>
<td>89%</td>
<td>83%</td>
<td>76%</td>
<td>n/a</td>
<td>70%</td>
</tr>
<tr>
<td>Smoking: Medications Offered</td>
<td>84%</td>
<td>n/a</td>
<td>51%</td>
<td>n/a</td>
<td>39%</td>
</tr>
<tr>
<td>Smoking: Referral/Strategies</td>
<td>92%</td>
<td>n/a</td>
<td>48%</td>
<td>n/a</td>
<td>39%</td>
</tr>
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**Chronic Disease Management**

**Clinical Metrics Meet or Exceed Private Sector**

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<tr>
<td>Diabetes: DM control HbA1c&lt; 9.0%</td>
<td>84%</td>
<td>84%</td>
<td>71%</td>
<td>71%</td>
<td>52%</td>
</tr>
<tr>
<td>Diabetes: LDL-C&lt;100</td>
<td>68%</td>
<td>64%</td>
<td>44%</td>
<td>47%</td>
<td>31%</td>
</tr>
<tr>
<td>Diabetes: Eye Exam</td>
<td>86%</td>
<td>85%</td>
<td>55%</td>
<td>63%</td>
<td>50%</td>
</tr>
<tr>
<td>Diabetes: Renal Exam</td>
<td>93%</td>
<td>91%</td>
<td>81%</td>
<td>86%</td>
<td>74%</td>
</tr>
<tr>
<td>Diabetes: BP &lt; 140/90</td>
<td>78%</td>
<td>77%</td>
<td>64%</td>
<td>59%</td>
<td>56%</td>
</tr>
<tr>
<td>Hypertension: BP &lt; 140/90</td>
<td>75%</td>
<td>76%</td>
<td>62%</td>
<td>58%</td>
<td>53%</td>
</tr>
<tr>
<td>Immunizations: Influenza</td>
<td>84%</td>
<td>72%</td>
<td>49%</td>
<td>72%</td>
<td></td>
</tr>
<tr>
<td>Immunization: Pneumococcal</td>
<td>94%</td>
<td>90%</td>
<td>n/a</td>
<td></td>
<td>67%</td>
</tr>
</tbody>
</table>
PATIENT SATISFACTION

Inpatient

2005 2006 2007 2008
65 70 75 80 85 90
VHA
Private-sector

Outpatient

2005 2006 2007 2008
65 70 75 80 85 90
VHA
Private-sector

Source: American Customer Satisfaction Index

PERFORMANCE INFORMATION
POSTED FOR PUBLIC VIEWING

www.va.gov/health/HospitalReportCard.asp
Use of Electronic Health Records in U.S. Hospitals

Ashish K.Jha, M.D., M.P.H., et al

Mar 25, 2009

“Some providers, such as the VHA, have successfully implemented electronic-records systems. VHA hospitals have used electronic health records for more than a decade with dramatic associated improvements in clinical quality. Their medical records are nearly wholly electronic, and including them in our analyses led to a doubling of our count of U.S. hospitals with a comprehensive system.”

AND IN THE POPULAR PRESS

“The Department of Veterans Affairs medical system once epitomized poor-quality care. But after a series of changes, the system has been hailed in recent years as a model for health care reform. Now, survey results released this week indicate that those improvements have translated into a high level of satisfaction among veterans getting treated by the rehabilitated VA.”

Washington Post, January 20, 2006
BEST HEALTH CARE ANYWHERE

2006 – HARVARD INNOVATIONS AWARD
Ultra-Large-Scale Systems
The Software Challenge of the Future

Download or purchase at http://www.nap.edu/catalog.php?record_id=12912
Innovators ➔ Laggards: Individual Variations


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**From Digital Infrastructure for the Learning Health System**

**BOX 9.3**

Ultra-Large-Scale (ULS) System Characteristics

The ULS approach can be best described by a set of characteristics that tend to arise as a result of the scale of the system (in this case health and health care) rather than a prescriptive set of required components. Previous work on the ULS concept has identified the following key characteristics of ULS systems:

- **Decentralization:** The scale of ULS systems means that they will necessarily be decentralized in a variety of ways—decentralized data, development, evolution, and operational control.

- **Inherently conflicting, unknowable, and diverse requirements:** ULS systems will be developed and used by a wide variety of stakeholders with unknowably different, conflicting, complex, and changing needs.

- **Continuous evolution and deployment:** There will be an increasing need to integrate new capabilities into a ULS system whilst it is operating. New and different capabilities will be deployed, and unused capabilities will be dropped; the system will be evolving not in phases, but continuously.

- **Heterogeneous, incompatible, and changing elements:** A ULS system will not be constructed from uniform parts; there will be some “fit” even if the system is extended and modified.

- **Evolution of the people/system boundaries:** People will not just be users of a ULS system; they will be elements of the system, affecting its overall emergent behavior.

- **Normal failures:** Software and hardware failures will be the norm rather than the exception.

- **New paradigms for acquisition and policy:** The acquisition of a ULS system will be simultaneous with the operation of the system and require new methods for control.

**SOURCE:** Northrop et al., 2006.

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**29 MAY 2011 Kolodner - Leadership Lessons from VA 24**
TECHNICAL LESSONS LEARNED

MODERN SOLUTIONS?

- CPRS – [1995-96]
  - A graphic user interface (GUI) for clinicians on top of our “Hospital Information System”
  - 3-tiered architecture

  - US Exchange network project – VA, Defense Department, Indian Health Service
  - Service Oriented Architecture
MORE RECENT NON-VA SOURCES

- Report by the National Research Council in January 2009
- Observations on competing on infrastructure
Computational Technology for Effective Health Care

- Site visits to 8 US medical centers – leaders in applying health IT to health care

- Current implementations of health care IT. Many health care institutions do spend considerable money on IT, but the IT is often implemented in systems in a monolithic fashion that makes even small changes hard to introduce. Moreover, these applications do not take advantage of human-computer interaction principles, leading to poor designs that can increase the chance of error, add to rather than reduce work, and compound the frustrations of executing required tasks.

COMPETING ON INFRASTRUCTURE

- Mobile Phone experience – US vs. any other country
- Networking competitions before the “Internet” (WWW)

OPPORTUNITIES CREATED BY THE WORLD WIDE WEB
COMPETING ON INFRASTRUCTURE

- Mobile Phone experience – US vs. any other country
- Networking competitions before the “Internet” (WWW)
- Health IT - EHRs

SUMMARY?

- “We” know the “better” technical architecture
- No major vendor has the architecture providers will need in the future
- eHealth Initiatives need to proceed – benefits too great to delay
- When technology changes happen, can proceed quite quickly
  - World Wide Web
  - Mainframes → minicomputers → PCs
BUY, BUILD OR ???

- Buy – One vendor? Multiple vendor purchases?
- Build from scratch – probably not anymore
- Reengineer another product – alone or with others?
  - VA's current plans for a "Custodial Agent" for Open Source
- Work together – vendors and providers – to converge on a shared set of infrastructure platforms and tools
  - Early adopters ONLY, please
- Those who include successful strategies and options for change have the best chance of being the next generation of eHealth leaders
  - Where are you on the risk continuum?

LEADERSHIP’S ROLE IN “SOCIO” SUCCESSES
PATIENT-CENTERED CARE?

“Do we REALLY mean ‘Veterans First’?”

Kenneth W. Kizer, MD
Under Secretary for Health
Department of Veterans Affairs
1994-1999

FOSTERING INNOVATION

“If we’re not making mistakes, we’re not at the edge.”

Kenneth W. Kizer, MD
Under Secretary for Health
Department of Veterans Affairs
1994-1999
Creating a Safe Environment to Explore New Approaches

Success seems to be connected with action. Successful people keep moving. They make mistakes, but they don't quit.
– Conrad Hilton

Punishing honest mistakes stifles creativity. I want people moving and shaking the earth and they're going to make mistakes.
– Ross Perot

Forms in the Fog: Information Management in the “New VA”

The Honorable Kenneth W. Kizer, M.D., M.P.H.
Under Secretary for Health
Department of Veterans Affairs
Adapted from A Keynote Presentation to the VA Information Technology Conference
Austin, Texas
May 19, 1997

“One shape in the fog that is pretty clear now is that our future is about demonstratively providing value, and our ability to demonstrate value is tied to our ability to manage information…. Information technology is going to increasingly replace bricks and mortar as the foundation of our system, and will increasingly become the principle focus of our capital investment.”
"The computer is going to be to the clinician of the 21st century what the stethoscope has been to clinicians in the 20th century."

"Still another form that seems to be emerging from the fog is the changing role, or the changing nature, of the relationship between the consumer or user of the system and the clinical caregiver or provider of services."

AND FROM A NON-VA SOURCE

"Try, fail.
Try, fail.
Try, succeed, deploy."

William Stead, M.D.
Associate Vice Chancellor for Health Affairs &
Chief Strategy and Information Officer
Professor of Medicine and Biomedical Informatics
Vanderbilt University
LESSON

• Leaders in new technology are early adopters
  • Expected, even encouraged (responsible) risk-taking to foster a culture of innovation and creativity
  • Learn from previous mistakes:
    • Make “new, original” mistakes

WHEN YOU GET EHEALTH “RIGHT”

• Incremental improvements vs. Business Process Reengineering
• Implementations create demanding users
  • IF you are successful!
Socio “Specifics”

The REAL Innovations Come from the Users

• Bar Code Medication Administration
• VistAWeb
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 – and worldwide?

BCMA Assures:
- Right Medication
- Right Dose
- Right Patient
- Right Provider
- Right Time
Hurricane Katrina
Monday, August 29, 2005

- Hurricane Katrina reaches landfall
- Power and communications lost to 3 VA Medical Centers
- Generators provide emergency power
- Patient records inaccessible from remote facilities where displaced patients are treated

Biloxi VAMC – Before Hurricane Katrina
Biloxi VAMC – During Hurricane Katrina

Gulfport VAMC – Before Hurricane Katrina
GULFPORT VAMC – AFTER HURRICANE KATRINA

NEW ORLEANS VAMC – BEFORE HURRICANE KATRINA
Tuesday, August 30

- IT staff begin to make data for Gulf-area patients available to all VA facilities
  - Prescription and medical information for affected patients available through data warehouse
Wednesday, August 31

- IT personnel deployed to Houston to bring New Orleans database back on-line
- User-friendly, web-based access to Gulf-area data warehouse provided to clinicians at all VA facilities
Thursday, September 1

- 48 backup discs from New Orleans sent to Houston to be stood up
- Satellite unit installed to provide temporary network connectivity at Jackson
- VistAWeb update released to provide access to complete health records of Gulf Coast patients
A FEW OTHER LESSONS LEARNED

WHEN DRIVING FROM THE TOP:
START WITH THE EARLY ADOPTERS

- 1978 - Initial VA facilities chosen by Ted O’Neill’s team
- 1986 – the outstanding sites that were more advanced and used more of the application modules
- 1997 – the “lead” site to implement CPRS in each regional network
- Look for “positive deviant” who succeeds where most have failed – and find out what they did differently
  - Order entry – Washington DC VA Inpatient units
IMPLEMENTATION PROBLEMS WITH TIMELINE (VS MILESTONE)

- Bar Code Medication Administration (BCMA) driven based on timeline: “Implement it in two years.”
  - Took another 2 years to resolve problems at some sites
- “If you want it badly, you’ll get it badly.”

Some Initial BCMA Problems:
- Battery Life too short (some scanner brands)
- Wrist band smeared when wet (some printers)
- Medicine cart designs (some too large)

VA DISCOVERED THE “6-MONTH RULE”

- Recurring pattern emerged from experience
- Took 6 months for a “good enough” application to become self-sustaining within a clinical setting
  - Progress notes – Dallas VA Mental Health Clinic
- If not self-sustaining, likely something imposed that doesn’t fit clinical needs & workflow
  - Care Management Software
  - Patient Billing Documentation
Thank You

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