Case Study II - VA System Informatics and Genomics

Maren T. Scheuner, MD, MPH, FACMG
VA Greater Los Angeles Healthcare System
Dept of Medicine, David Geffen School of Medicine at UCLA
RAND Corporation

April 28, 2011
Disclosures

No conflicts of interest relating to the content of this presentation.

Funding sources for content:

• CDC, Office of Public Health Genomics
• CDC, Division of Laboratory Sciences
• VA Health Services Research & Development Program
Outline

• VHA and it’s EHR

• Genetics content in the EHR

• Implementation and evaluation of genetic tools for our EHR

• Tele-Genetics in VISN22
Veterans Health Administration

- Largest integrated delivery system in US; $36 billion dollar annual budget; $580 million for research
- Provides inpatient and outpatient care to Veterans (family members not eligible)
- Comprehensive care in multiple settings:
  - 152 hospitals/medical centers
  - 784 community clinics
  - 126 nursing home units
  - 35 domiciliaries
  - Home-based care programs
Healthcare Systems Exist within Networks
Patient Characteristics

US Veteran population = 22.6 million
- ~6 million utilize VHA
- 7% of all VHA users are female
- Of the ~500,000 OEF/OIF VHA users, 11% are female

VHA eligibility rules/copayment structures designed to support the poor and disabled
- VA patients sicker than age-matched counterparts*
- Greater burden of mental health conditions*

VA HIT Systems in Place Today

- Interoperable EHR system (locally)
- Availability of remote data: other VAs and DoD
- Digital imaging technology
- Disease registries/regional data warehouses
- Telehealth technology
- Personal health record
VHA and Quality of Care

VA now recognized nationally for quality

Transformation into a quality institution occurred as a result of:

- Reorganization to a primary care-focused system
- Quality measurement and accountability
- Independent data gathering programs
- Public availability of performance data
- Institution of integrated, comprehensive EHR
How did the EHR Help Improve Quality?

- 100% access to VA records
- New ability to identify patients by disease or other characteristics (coding, use of data elements)
- Ability to use data to create reports, provide feedback
- Computerized provider order entry
- Decision support tools at point of care including:
  - Notifications/alerts
  - Clinical reminders
  - Drug-drug or drug-allergy interactions
Factors Contributing to Success of EHR Adoption

- Culture of academic clinicians who value quality, scientific evidence & accountability
- Research infrastructure/funding for HIT
- Health services researchers involved in HIT development
- Incentives aligned → VA pays for HIT and benefits from cost savings
Genetics Content in CPRS at the VA Greater Los Angeles (GLA) Healthcare System
GLA’s EHR lacks standards for family history documentation

Between Aug 2007 - Jul 2008, 1,416 templates available for progress notes

Family history mentioned in 8%
  – Disease checklist most common format, 46%
  – Family history open text box, 38%
  – List of first-degree relatives with text box, 14%

None captured information about specific diseases in specific relatives.
## Limited CPRS Test Menu Offerings with Variability in Network 22

<table>
<thead>
<tr>
<th>Test</th>
<th>GLA</th>
<th>San Diego</th>
<th>Loma Linda</th>
<th>Long Beach</th>
</tr>
</thead>
<tbody>
<tr>
<td>APC reflex FVL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>F2 G20210A</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HLA B27</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HLA B5701</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>HFE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CFTR</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRAF</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key Informant Interviews

15 primary care providers at GLA interviewed (12 MDs and 3 NPs)

Interviews addressed practices and attitudes about:

– Family history collection/documentation
– Ordering of genetic tests
– Referral for genetics consultation
To Improve Process of Family History Documentation

PCPs want:

– Template in the EHR
– Better organization of the family history in the EHR
– Patient-provided data (through kiosk or personal health record)
Minimal Genetics Referral

Only 4 veterans referred in past 5 years for a genetic consult by 2 providers

Reasons for minimal referrals:
- Lack of availability of genetics professionals
- Lack of relevance (“Patients with genetic conditions not seen at VA”)
- Lack of knowledge/inability to recognize patients who might benefit
Genetic Testing in Past 5 Years

12 (80%) clinicians had ordered a genetic test:
- *FVL*: 9 ordered; 4 more than 5 times
- *HFE*: 10 ordered; 1 more than 5 times
- *BRCA1/2*: 2 ordered; only 1 or 2 times
- Lynch syndrome: 0 ordered

GLA laboratory reported:
- Only 6 *BRCA1/2* tests performed
- No testing for Lynch syndrome
High Ratings for Clinical Reminders

- Stratify familial risk
- Recognize inherited conditions
- Prompt referrals for consultation or testing

Reasons for high ratings:
- Lack of knowledge, familiarity and confidence in genetic risk assessment, diagnosis and testing
Priority Setting Panel
13 VA and Non-VA Experts
Highest Priorities for Health Services Research at VA in the Next 5 Years

- Genetics education
- Development of clinical guidelines
- Development of tools in CPRS for:
  - Familial risk assessment
  - Ordering and interpreting genetic tests
“Family History Education to Improve Risk Assessment for Hereditary Cancer”

Funded by CDC OPHG Translation Program
October 2008 - September 2011
Goal

To develop an education program for primary care clinicians that improves recognition and referral of patients at risk for hereditary cancer.
Family History Is Important To Your Health

What to Expect from a Genetic Consultation

The goal of a genetic consultation is to learn about a possible inherited condition and how it may affect your health and healthcare.

Indications for a Cancer Genetics Consultation
Setting & Population

Setting:

• Women’s Clinics at the VA Greater Los Angeles Healthcare System

Patient population:

• About 4,000 unique patient visits each year
• Racially diverse with an average age late 40s

Clinician population:

• Primary care clinicians (and residents)
• PCPs all female
• Average years in primary care at VA, 8 (1.5 – 18)
What Worked?

Unanimously endorsed

– EHR reminder with cancer family history template and referral guideline
– Lecture series

Mixed feedback

– Patient administered family history questionnaire
– Clinician practice-feedback reports

Less positively endorsed

– Paper-based information sheets
– GCAT website
Use of Cancer Family History Reminder
April 2010 - March 2011

For the 7 enrolled providers

- 2,896 patients seen with reminder due
  - Avg, 413; range, 54 - 771

- 1,024 reminders completed when due
  - Avg, 35%; range, 23% - 98%

- 108 (10%) referred for genetic consult
  - 54% of patients with a strong familial risk
  - 14% of patients with a moderate familial risk
  - 2% of those with a weak familial risk
Cancer Family History Documentation

- **Pre-implementation**
  - Oct-Dec 2009 (n=76): 28% By text, 28% By Template

- **Post-implementation**
  - Apr-Jun 2010 (n=101): 50% By text, 50% By Template
  - Jul-Sep 2010 (n=109): 54% By text, 54% By Template
  - Oct-Dec 2010 (n=112): 60% By text, 60% By Template

(Revised dates and numbers per the chart)
Cancer Family History Documentation

<table>
<thead>
<tr>
<th>Pre-implementation</th>
<th>Post-implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-Dec 2009 (n=76)</td>
<td>28%</td>
</tr>
<tr>
<td>Apr-Jun 2010 (n=101)</td>
<td>50%</td>
</tr>
<tr>
<td>Jul-Sep 2010 (n=109)</td>
<td>54%</td>
</tr>
<tr>
<td>Oct-Dec 2010 (n=112)</td>
<td>60%</td>
</tr>
</tbody>
</table>
## Improved Quality of Cancer Family History Documentation

<table>
<thead>
<tr>
<th></th>
<th>Pre-implementation (n=21)</th>
<th>Post-implementation (n=117)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st degree relatives, %</td>
<td>76</td>
<td>81</td>
</tr>
<tr>
<td>2nd degree relatives, %</td>
<td>48</td>
<td>62</td>
</tr>
<tr>
<td>Lineage of relatives, %</td>
<td>14</td>
<td>62</td>
</tr>
<tr>
<td>Age of cancer onset, %</td>
<td>19</td>
<td>43</td>
</tr>
<tr>
<td>Jewish ancestry, %</td>
<td>0</td>
<td>45</td>
</tr>
</tbody>
</table>
Interviews with Primary Care Providers

“My documentation of cancer family history has improved… I had a template I was using and it was limited to the colon, breast, uterine and ovarian cancer, so now it’s expanded because we have all those other options.”

“Now my documentation is very detailed, whereas before I would just mainly ask about mom and dad.”
Interviews with Primary Care Providers

“I probably wasn’t doing that in-depth of a family history before, especially not focused on cancer.”

“The template is much broader and more detailed than what I probably would have gotten before. I don’t know if I would have gone down to all those relatives…, and it certainly triggered a number of consultations in some people who probably deserved it a long time ago. So I think this has greatly improved my history-taking.”
Interviews with Primary Care Providers

“I have gained in so many ways by participating in this project. For one, I have refreshed and expanded my knowledge about genetics in general, and I’ve gained substantial new knowledge about hereditary cancers in particular. As a result of my participation, I now feel quite confident in recognizing “red flag” patterns of cancer in my patients’ family histories. I don’t necessarily identify exactly which syndrome a patient may have, but I can ascertain when further evaluation is needed, can understand what the results of tests mean for a patient, and understand my obligation to follow through if additional surveillance or referrals are needed.”
Conclusions

Our education program has been a success.
The electronic health record has been instrumental.

- More comprehensive family history documentation necessary for familial risk assessment.
- Improved recognition and referral of high-risk patients.
“Evaluation of an Educational Program for Clinical Decision-Making that Features Model Genetic Test Reports for Heritable Conditions”

Funded by CDC Division of Laboratory Sciences
October 2010 - September 2013
GOAL

To develop an empirically sound approach to improve the integration of genetic test findings into medical decisions that result in improved outcomes for Veterans
VA HSR&D Center for the Study of Healthcare Provider Behavior

Logic Model

- Genetic Consultation
- Diagnosis, Risk Assessment, Management & Prevention
- Strategies to Improve Communication of Test Results & Interpretation
- Strategies to Improve Test Ordering
- Test Utilization
- Healthcare System

Interventions
Outcomes
(Click box above to start)

Patient Information:
PATIENT NAME: FIVE 22DUMMY
PATIENT'S CURRENT PHONE NUMBER PER CPRS: 000 000 0000
PATIENT'S ADDRESS PER CPRS: C/O U.S. BUREAU
LOS ANGELES, CALIFORNIA 90012
PATIENT'S AGE: 34
PATIENT'S SEX: MALE
PATIENT'S RACE: RACE UNKNOWN
PATIENT'S ETHNICITY: NOT HISPANIC OR LATINO
PATIENT'S RELIGIOUS PREFERENCE: UNKNOWN/NO PREFERENCE
IS THE PATIENT'S INFORMATION ABOVE CORRECT? *Yes ☐ No
If "No", please update information below:

Referring Provider:
NAME: AUSTIN, COLLETTA
SERVICE/SECTION: INFORMATION RESOURCE MGMT
PHONE EXT: 3104783711 42450
VA PAGER:
UCLA PAGER:
OTHER PAGER(S):
IS THE REFERRING PROVIDER contact information above correct? *Yes ☐ No
If "No", please update information below:

Are you a student, intern or resident? *Yes ☐ No
If "Yes", what is the name and contact information for the VA attending physician

What is the indication for genetic testing? (select only one)

☐ DIAGNOSTIC TESTING: Patient has signs, symptoms or past history suggestive of a hereditary condition.

☐ PRE-SYMPTOMATIC TESTING: Patient without signs, symptoms or past history but at risk for a hereditary condition due to family history or other characteristic

☐ PHARMACOGENETIC TESTING: To inform choice of therapy or dosing requirements, or assess response to therapy, including potential for an adverse event (includes viral and bacterial genotyping)

☐ CARRIER SCREENING: To inform reproductive decisions for recessive hereditary conditions

☐ PRENATAL TESTING: To diagnose a genetic condition in a fetus

☐ OTHER TESTING: Please specify:
The Genetics Laboratory  1111 Laboratory Avenue, Nowhere, State 00839
Tel: (555) 920-3333  Fax: (555) 920-3333
Email: labdirector@genelab.com, www.thegeneticslab.com

Patient name:          Ordering physician:
Date of birth:         Patient age:
Lab accession No.:     Requisition date:
Patient sex:           Date of report:
Patient ethnicity/race:
Patient clinical history:
Patient family history:

Test indication:
Test Performed:
Specimen type:         Date collected:

Test Result:
Interpretation:

These results and the Interpretation, including guidance and supplemental information, were reviewed and approved by:

John Doe, PhD, Director, The Genetics Laboratory

Guidance
- General suggestions for management & prevention (includes mention of genetic consultation)
- Patient-specific suggestions for management & prevention
- Availability of laboratory for questions with phone number (if available)

Supplemental Information
- Clinical aspects of condition/disorder
- Genetic aspects of condition/disorder
- Test method
- Test method validity and limitations
- Information resources for clinicians
- Information resources for patients
- General disclaimer
- Cite references for report facts
Design & Setting

- Quasi-experimental, pre/post design
- We will compare outcomes of interest in an intervention group (clinicians at GLA) and control groups (clinicians at San Diego and Loma Linda).
### Outcomes of Interest

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Measured by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and attitudes about ordering and interpreting genetic tests</td>
<td>Surveys and interviews pre- and post-implementation</td>
</tr>
<tr>
<td>Appropriate test utilization (i.e., according to guidelines)</td>
<td>Genetic test request consult; chart review</td>
</tr>
<tr>
<td>Documentation of informed consent</td>
<td>Chart review</td>
</tr>
<tr>
<td>Discussion of familial implications of test result</td>
<td>Chart review</td>
</tr>
<tr>
<td>Referral for genetic consultation</td>
<td>Chart review; genetics clinical activity report</td>
</tr>
<tr>
<td>Risk appropriate recommendations</td>
<td>Chart review</td>
</tr>
</tbody>
</table>
Tele-Genetics is Next

Goal: to increase access to effective, efficient and patient-centered genetic services for Veterans and their providers in VISN 22.

Performance measure GLA Clinical Genetics Service: Increase inter-facility consults by 30% in Year 1.
<table>
<thead>
<tr>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of CPRS access at non-GLA medical centers and CBOCs</td>
<td>MOUs for privileges; service agreements; IFC consults; implement CPRS reminders &amp; templates</td>
</tr>
<tr>
<td>Coordination with network laboratories</td>
<td>Implement genetic test request consult at all sites; develop protocols and toolkit for each lab</td>
</tr>
<tr>
<td>Inertia related to genetics, telehealth, and use of clinical reminders</td>
<td>Opportunities for outreach/education (in-person and videoconferencing)</td>
</tr>
<tr>
<td>Capacity of clinical genetics and telehealth programs</td>
<td>Support from network leadership; identify champions at distant sites</td>
</tr>
</tbody>
</table>
Conclusions

- VHA has a robust HIT system that improves quality of care.
- Currently, genetic content in the VA’s EHR is limited and variable.
- CPRS decision support tools can improve integration of genetic services into routine care.
- Tele-genetics promises to improve access to clinical genetic services.