Case Study II - VA System Informatics and Genomics

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- 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

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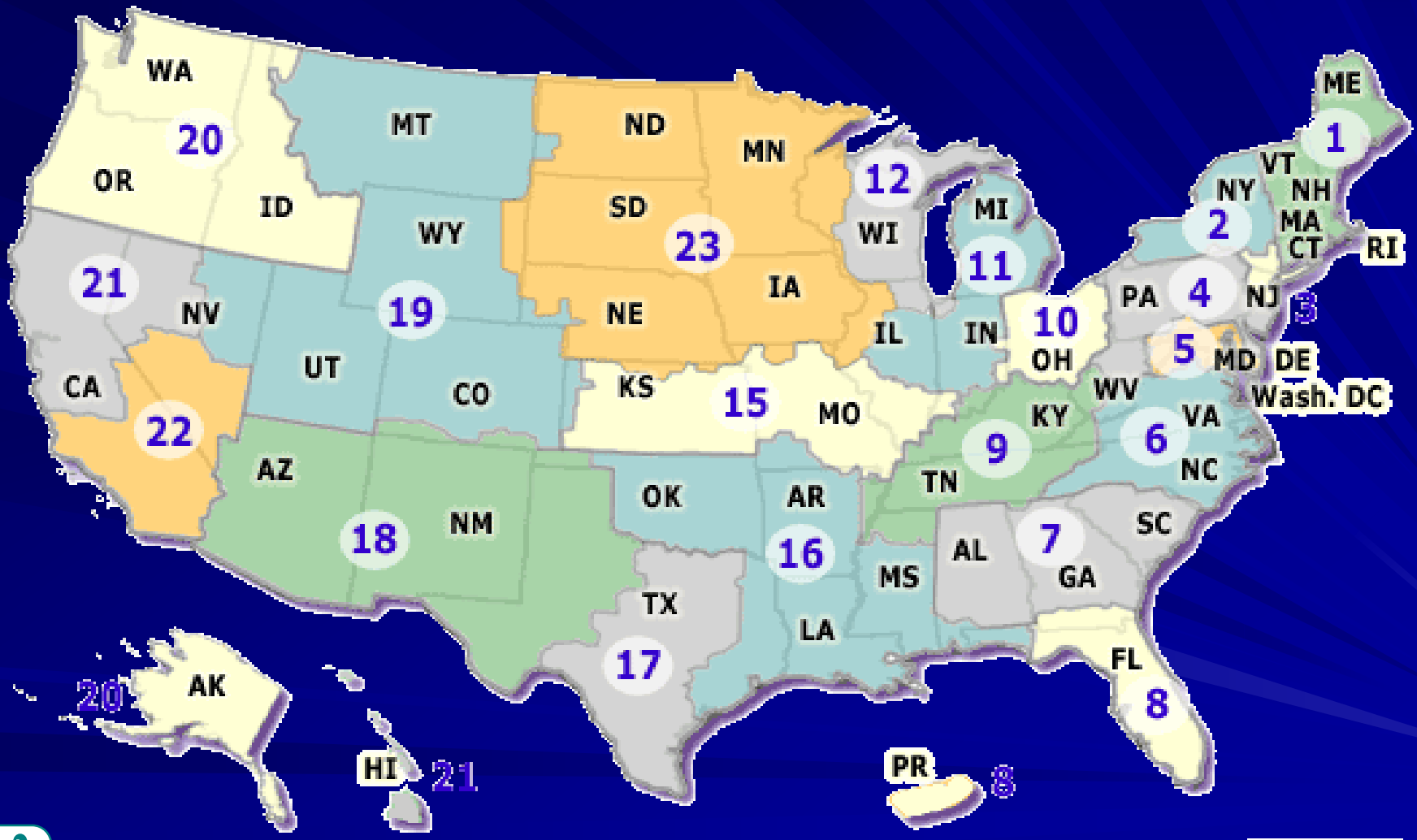
BAKERSFIELD
San Luis Obispo
Lompoc
Antelope Valley
SANTA BARBARA
Oxnard
SEPULVEDA
WEST LA
LOS ANGELES
East LA
Culver City
Gardena
Greater
Los Angeles
Medical Center
Ambulatory Care Center
CBOC
Nursing Home Care Unit

Healthcare Systems Exist within Networks



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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*

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*Kazis et al. Arch Intern Med 1998 Mar 23;158(6):626-32

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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

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Genetics Content in CPRS at the VA Greater Los Angeles (GLA) Healthcare System

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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

	GLA	San Diego	Loma Linda	Long Beach
APC reflex FVL	X	X	X	
F2 G20210A	X	X	X	
HLA B27	X	X	X	X
HLA B5701	X		X	X
HFE	X	X	X	X
CFTR	X			
BRAF	X	X		

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

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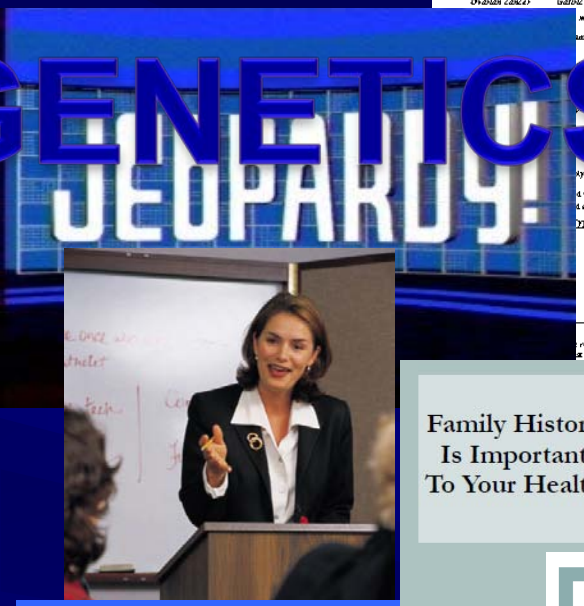
Goal

To develop an education program for primary care clinicians that improves recognition and referral of patients at risk for hereditary cancer.

Multi-component Education Program

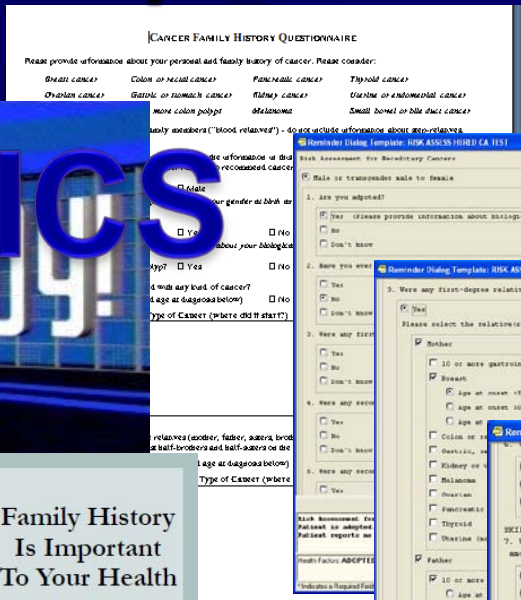


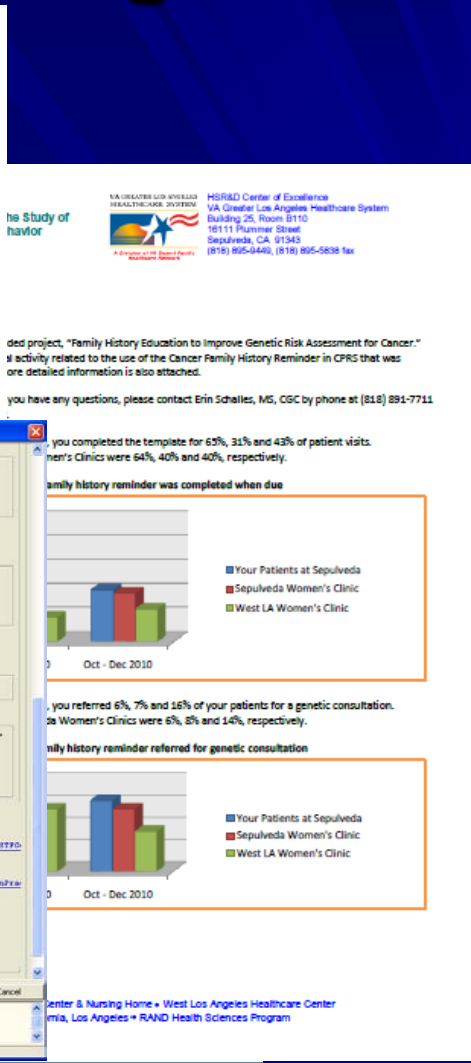
7-Part, CME Lecture Series

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

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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

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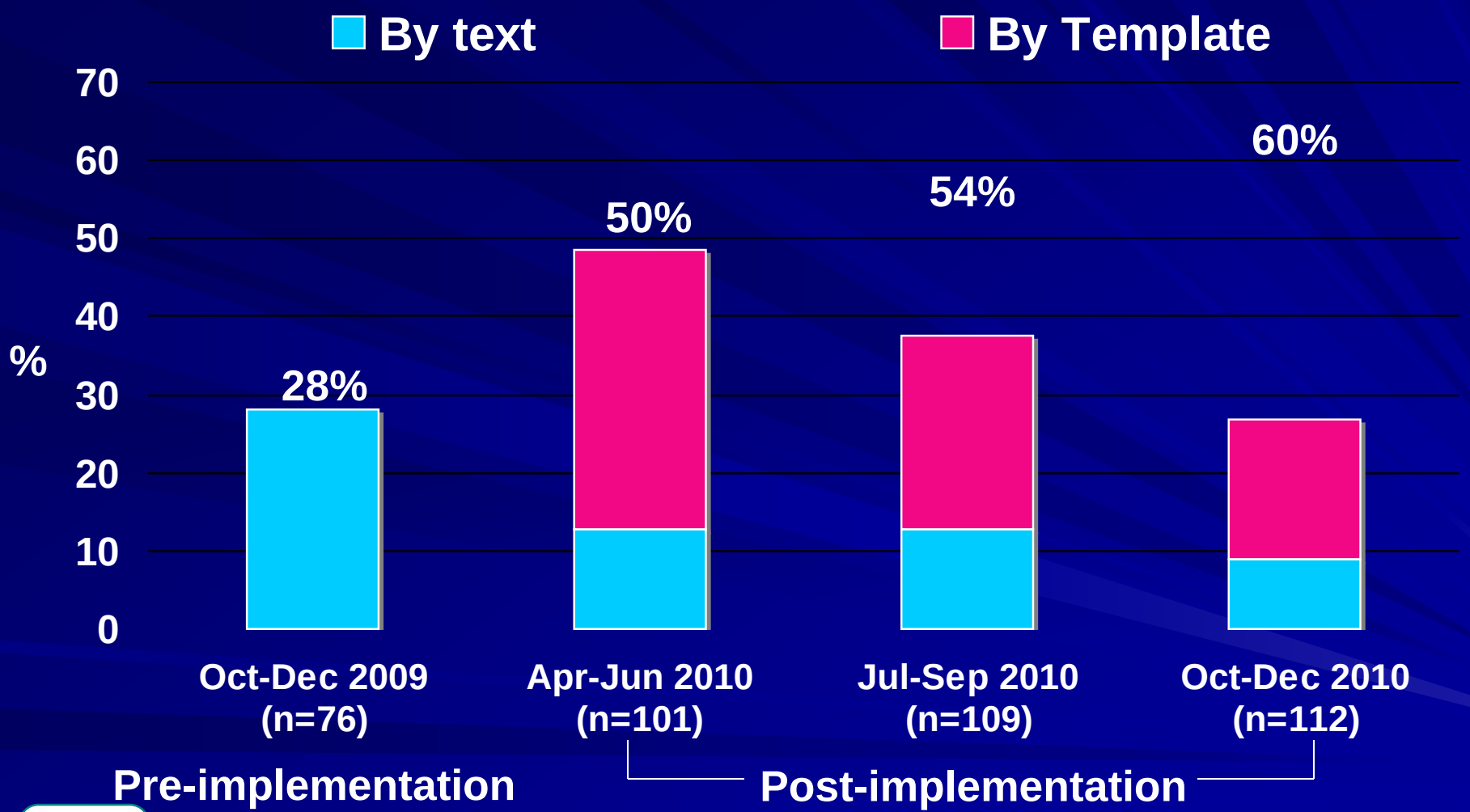
Cancer Family History Documentation



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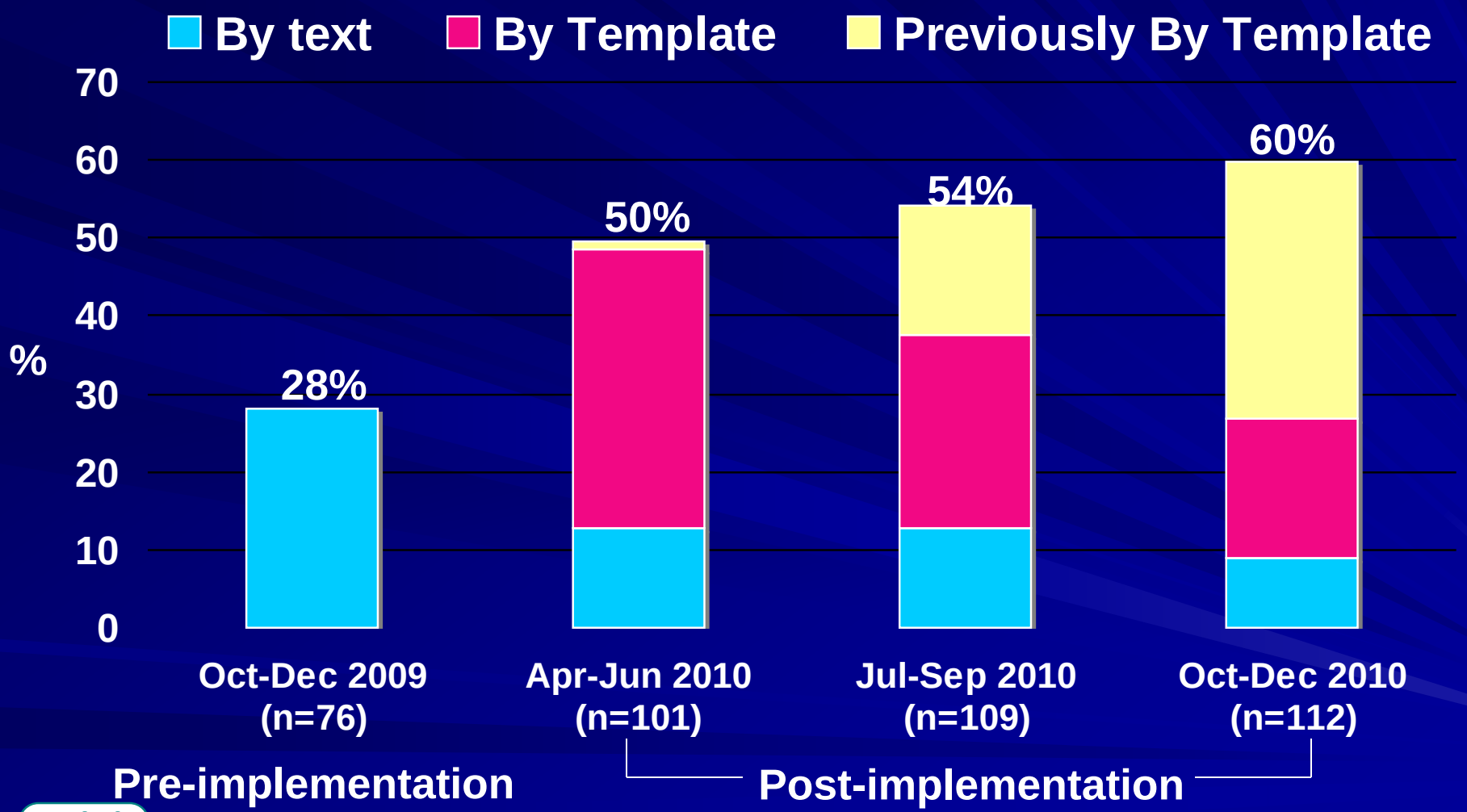
Cancer Family History Documentation



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Improved Quality of Cancer Family History Documentation

	Pre-implementation (n=21)	Post-implementation (n=117)
1st degree relatives, %	76	81
2nd degree relatives, %	48	62
Lineage of relatives, %	14	62
Age of cancer onset, %	19	43
Jewish ancestry, %	0	45

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

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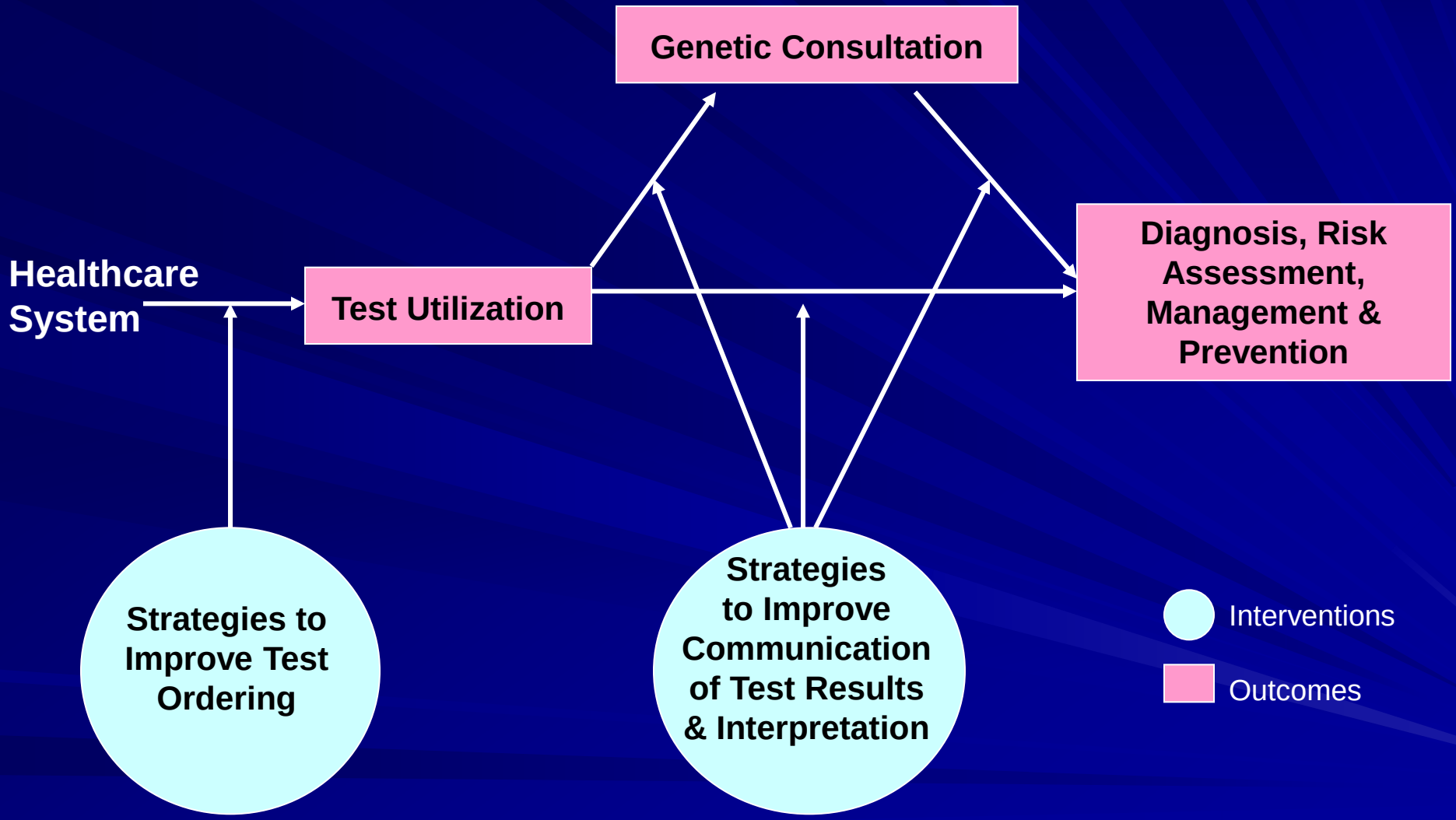
GOAL

To develop an empirically sound approach to improve the integration of genetic test findings into medical decisions that result in improved outcomes for Veterans

Logic Model



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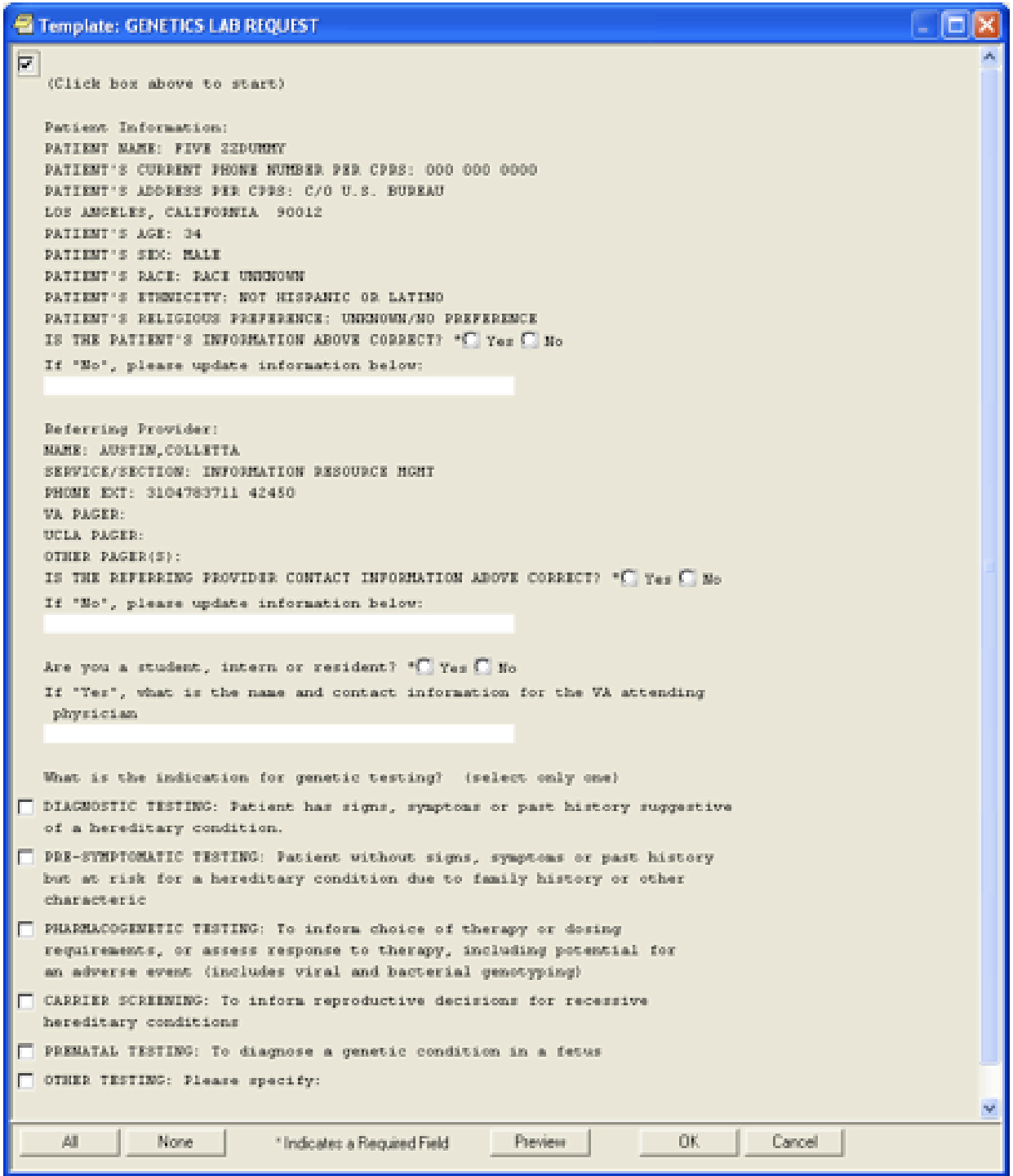
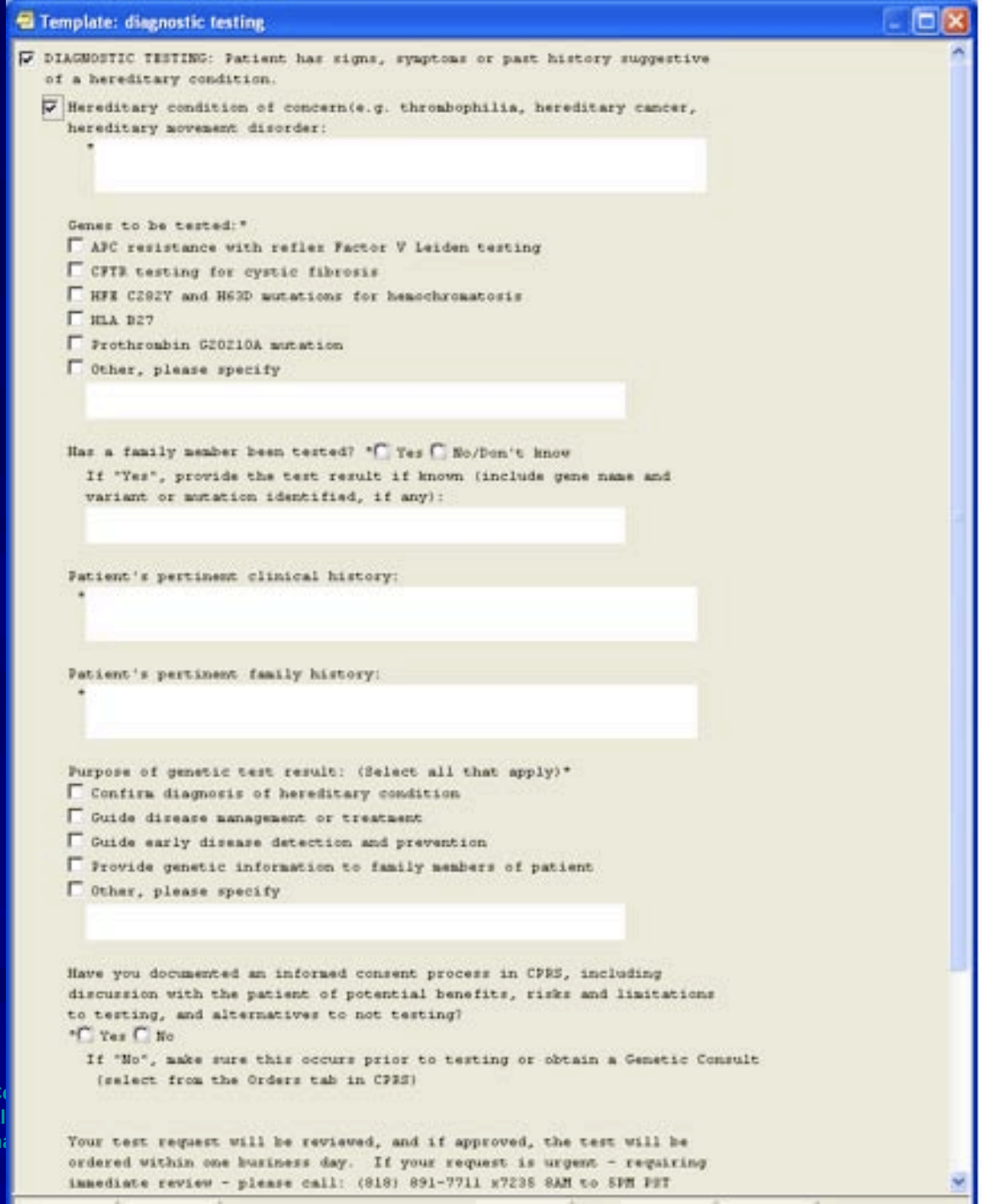

Template: GENETICS LAB REQUEST
(Click box above to start)
Patient Information:
PATIENT NAME: FIVE 22DUMMY
PATIENT'S CURRENT PHONE NUMBER PER CPRS: 000 000 0000
PATIENT'S ADDRESS PER CPRS: C/O U.S. BUREAU
LOS ANGELES, CALIFORNIA 90012
PATIENT'S AGE: 34
PATIENT'S SEX: MALE
PATIENT'S RACE: RACE UNKNOWN
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 characteric
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:
All
None
* Indicates a Required Field
Preview
OK
Cancel


Template: diagnostic testing
DIAGNOSTIC TESTING: Patient has signs, symptoms or past history suggestive of a hereditary condition.
Hereditary condition of concern(e.g. thrombophilia, hereditary cancer, hereditary movement disorder:
*
Genes to be tested:*
APC resistance with reflex Factor V Leiden testing
CFTR testing for cystic fibrosis
HFE C282Y and H63D mutations for hemochromatosis
HLA B27
Prothrombin G20210A mutation
Other, please specify
Has a family member been tested? * Yes No/Don't know
If "Yes", provide the test result if known (include gene name and variant or mutation identified, if any):
Patient's pertinent clinical history:
*
Patient's pertinent family history:
*
Purpose of genetic test result: (Select all that apply)*
Confirm diagnosis of hereditary condition
Guide disease management or treatment
Guide early disease detection and prevention
Provide genetic information to family members of patient
Other, please specify
Have you documented an informed consent process in CPRS, including discussion with the patient of potential benefits, risks and limitations to testing, and alternatives to not testing?
* Yes No
If "No", make sure this occurs prior to testing or obtain a Genetic Consult (select from the Orders tab in CPRS)
Your test request will be reviewed, and if approved, the test will be ordered within one business day. If your request is urgent - requiring immediate review - please call: (818) 891-7711 x7238 8AM to 5PM PST

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:
Date of birth:
Lab accession No.:
Patient sex:
Patient ethnicity/race:
Patient clinical history:
Patient family history:

Ordering physician:
Patient age:
Requisition date:
Date of report:

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 _____ Date

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*

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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

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

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.

Tele-Genetics Challenges and Solutions

Challenges	Solutions
Lack of CPRS access at non-GLA medical centers and CBOCs	MOUs for privileges; service agreements; IFC consults; implement CPRS reminders & templates
Coordination with network laboratories	Implement genetic test request consult at all sites; develop protocols and toolkit for each lab
Inertia related to genetics, telehealth, and use of clinical reminders	Opportunities for outreach/ education (in-person and videoconferencing)
Capacity of clinical genetics and telehealth programs	Support from network leadership; identify champions at distant sites

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