VA Genomic Medicine Program

An Overview

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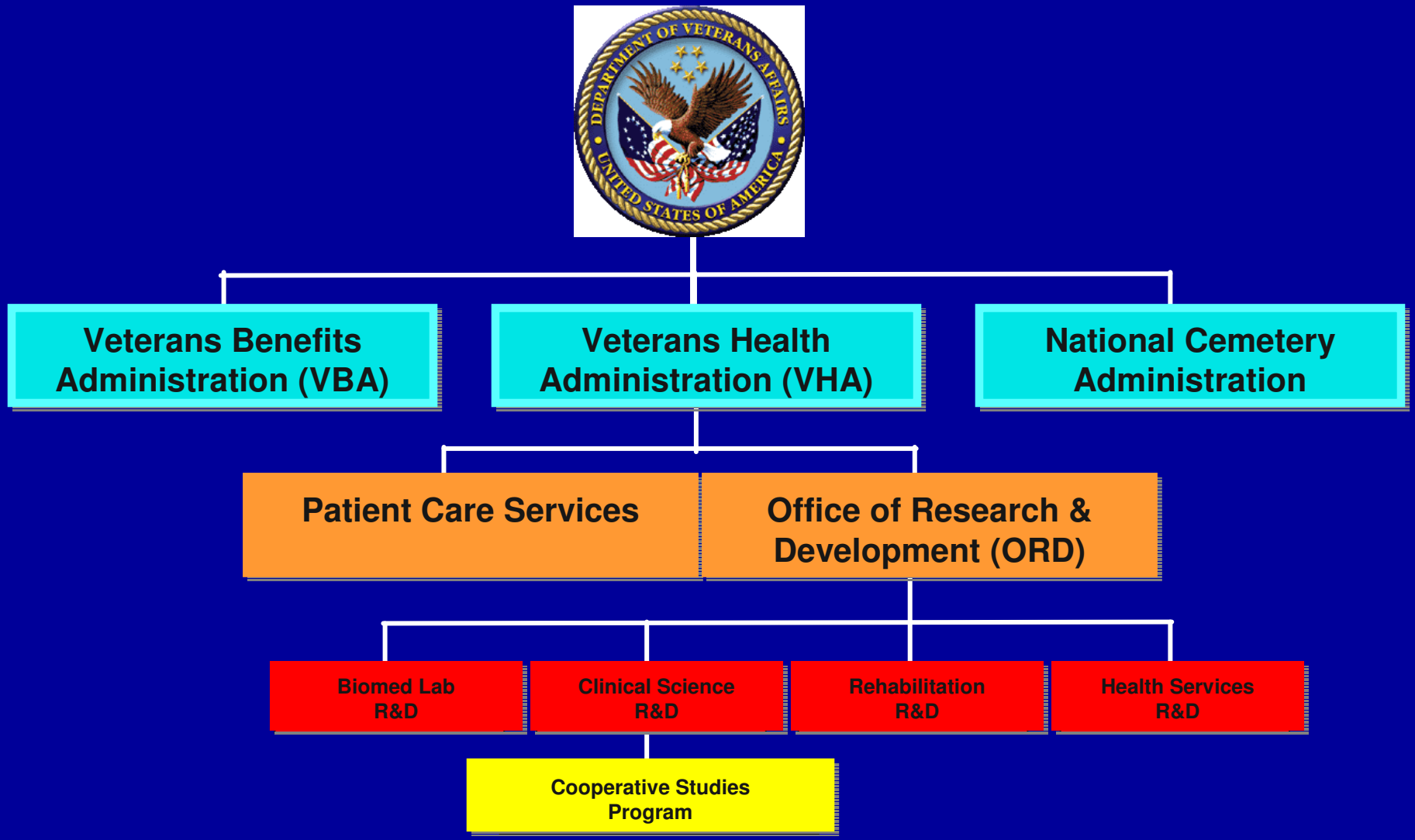
Facts About VA

- Largest healthcare system in the US
- 5.5M unique patients treated in FY 07
- 153 hospitals, 745 CBOCs, 245 Vet Centers
- Electronic medical record system
- Stable population
- Affiliation with academic institutions
- Major training hospitals for clinicians

VA Organizational Chart



VA Genomic Medicine Program

- In 2006, the Department of Veterans Affairs formally launched the Genomic Medicine Program
  - to examine the potential of emerging genomic technologies to optimize medical care for veterans

Advisory Committee

- As a first step, the Secretary established a distinguished 13-member Genomic Medicine Program Advisory Committee (GMPAC), a FACA committee, to lay the groundwork for the program
- Members include leaders in the fields of genetics research and medical genetics, genomic technology, health information technology, healthcare delivery, policy, program administration, legal counsel; they come from the public and private sectors and academia; representative of a VSO

GMPAC Members

Wayne Grody, MD, PhD (Chair), Professor & Director of Molecular Pathology Laboratory, UCLA

Michael S. Watson, PhD, FACMG, Exe. Director, American College of Medical Genetics

Geoffrey S. Ginsburg, MD, PhD, Director, Center for Genomic Medicine, Duke University

Muin J. Khoury, MD, PhD Director, NOPHG, CDC

Daniel R. Masys, MD, Prof.& Chair of Biomedical Informatics, Vanderbilt University

Jonathan B. Perlin, MD, PhD, MSHA, FACP, CMO and Senior Vice-President, HCA Healthcare

Margaret McGovern, MD, PhD, Prof. Human Genetics at Mount Sinai

Peter G. Traber, MD, President & CEO, Baylor College of Medicine

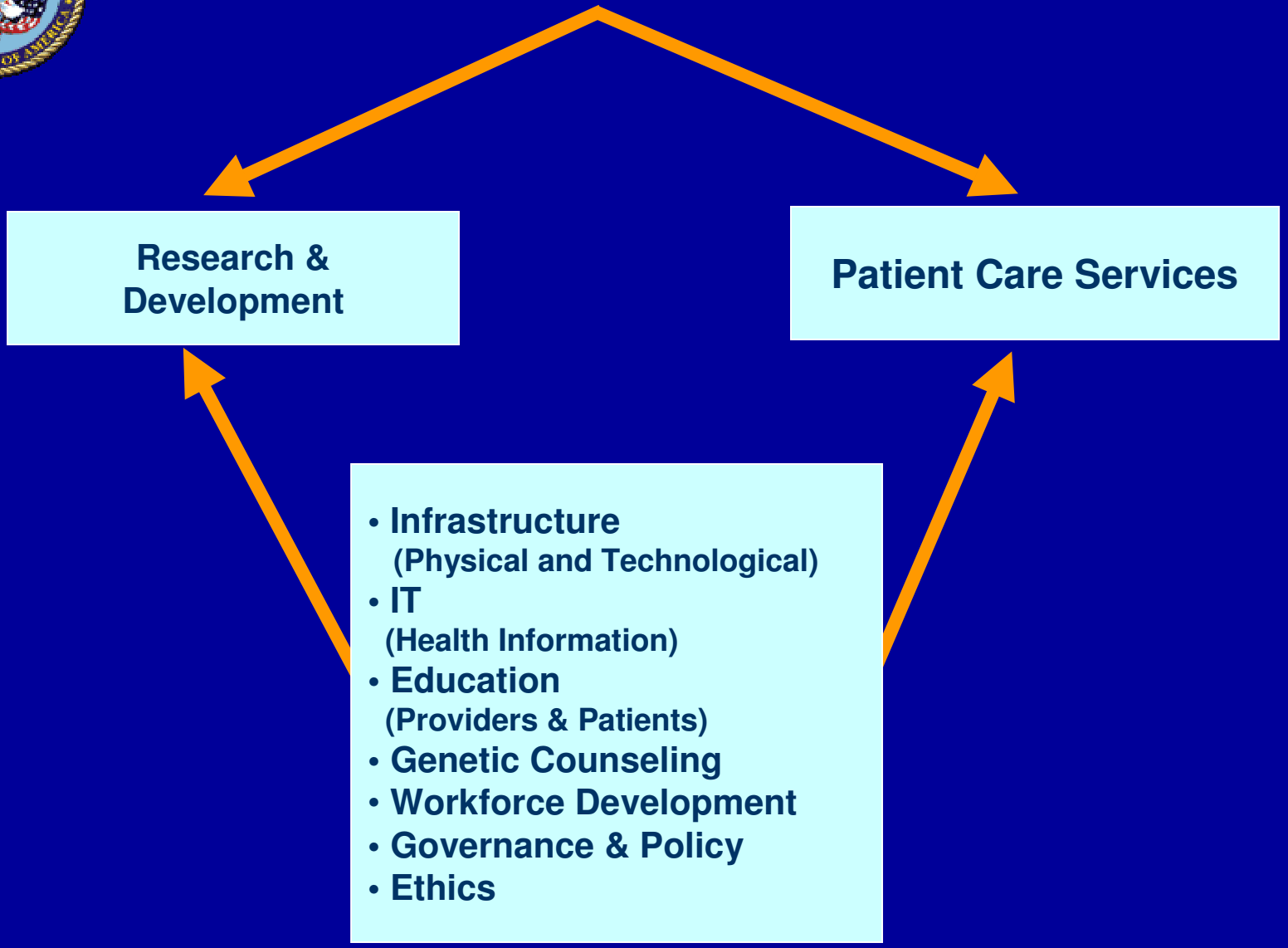
Annette Taylor, MS, PhD, President, Director, Founder, Kimball Genetics

Brion C. Smith, Col USA (Ret.) DDS, DOD Defense DNA Registry

David S. Gorman, Exe. Director, Disabled Veterans of America

Christine Q. Burtt, President CQB Associates, Denver, CO

Implementation



Challenges

- Large operationally decentralized system
- Variability in infrastructure, operations, capabilities
- OIT distinct from VHA
- Budget constraints
- Rapidly evolving technologies
- Will veterans participate?

Veteran Consultation Project

- In 2007, VA launched a consultation project to assess veterans' knowledge and attitudes about genomic medicine
  - Interagency agreement with NHGRI and conducted under a cooperative agreement by the Genetics and Public Policy Center (GPPC) at Johns Hopkins University
    - PI Kathy Hudson
  - Focus Groups and Survey

Assessing Veteran's Attitudes About the Genomic Medicine Program

- 10 focus groups in five locations of diverse participants in 2007
  - Solicit a wide range of perspectives
  - Identify themes and issues
- Survey of 931 participants in 2008
  - To test themes and messages from focus groups
  - Paper describing findings in press in the journal *Genetics in Medicine*

Survey Results

- 83% said program should be done
- 71% said they would participate
- 61% also said they would:
  - Attend a ½ day exam
  - Allow medical records from non-VA health care to be added to the database
  - Have follow up exams over time

Survey Results Con't

- Willingness to participate was associated with
  - Attitudes about research
  - Attitudes about helping and history of previous "altruistic behaviors"
  - Curiosity about genetics
  - Satisfaction with VA

Where Do We Start?

- What is available within the VA system?
- Build in house capability or leverage infrastructure at affiliated universities and contract with industry?
- Research agenda?

Cooperative Studies Program

- Large multisite clinical trials
- Four clinical trials coordinating centers
- Four Epidemiology Research and Informatics Centers (ERICs)
- Health economics research ceneter
- Pharmacy coordinating center
- Central IRB

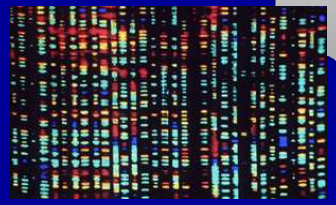
Infrastructure Development

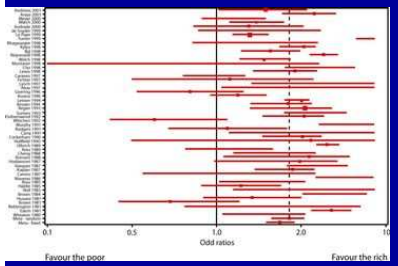
- DNA Bank/Biorepository (Boston VA)
  - About 30,000 blood samples collected as part of multi-site VA clinical trials (Cooperative Studies Program), with capacity for banking 100,000 samples
  - 6000 DNA samples
  - RTS storage system and robotics
  - Shadow bank
- DNA Coordinating Center at Palo Alto VA (link to clinical information and data analysis)
- Tissue repository (Tucson VA)
  - Brain collection, tissue blocks

Infrastructure Development Con't

- Established Pharmacogenomics Analysis Laboratory in Little Rock, AR
  - Clinical Laboratory Improvement Amendments (CLIA) certified research genomics laboratory
  - Illumina platform
- Genomics Research Core at the San Antonio VAMC (funded)

Infrastructure Development





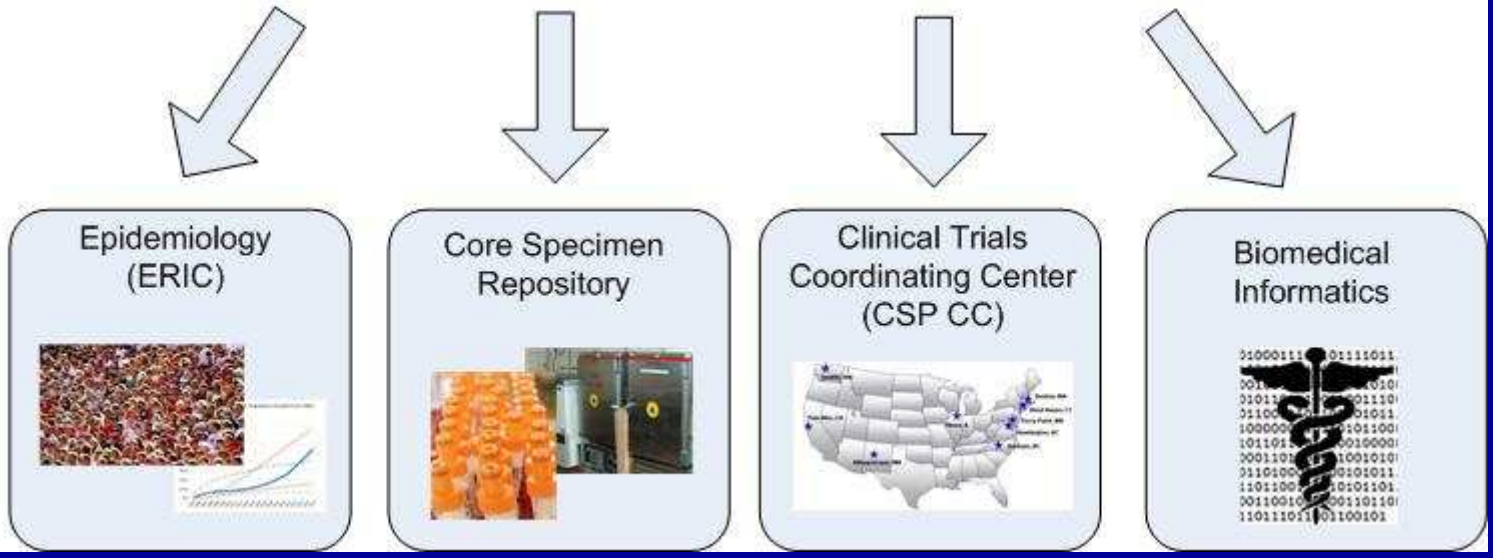
IT Infrastructure Development

- GenISIS
  - Genomic Information System for Integrative Science
  - Louis Fiore, MD
- VINCI
  - Veterans' Informatics, Information & Computing Infrastructure
  - Jonathan Nebeker, MS MD

GenISIS

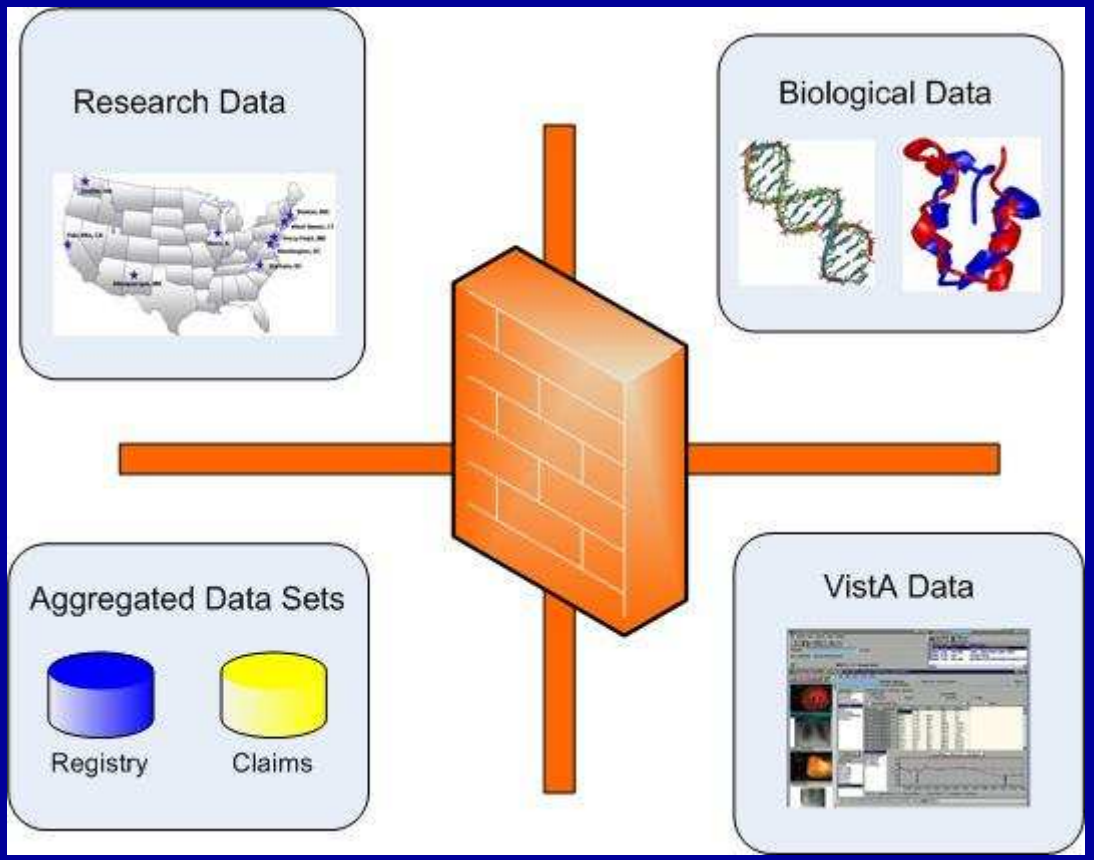
MAVERIC

MASSACHUSETTS VETERANS EPIDEMIOLOGY RESEARCH AND INFORMATION CENTER



GenISIS

Current Research Paradigm



Current Model

- Hypothesis testing
- Discipline-driven
- Targeted data collection
- Single use of “owned” data in silos

Emerging Model

- Comprehensive data collection and retention
- Data analyses
- Hypothesis ***generation (and validation)***
- Interdisciplinary (Team science)
- Reuse of data

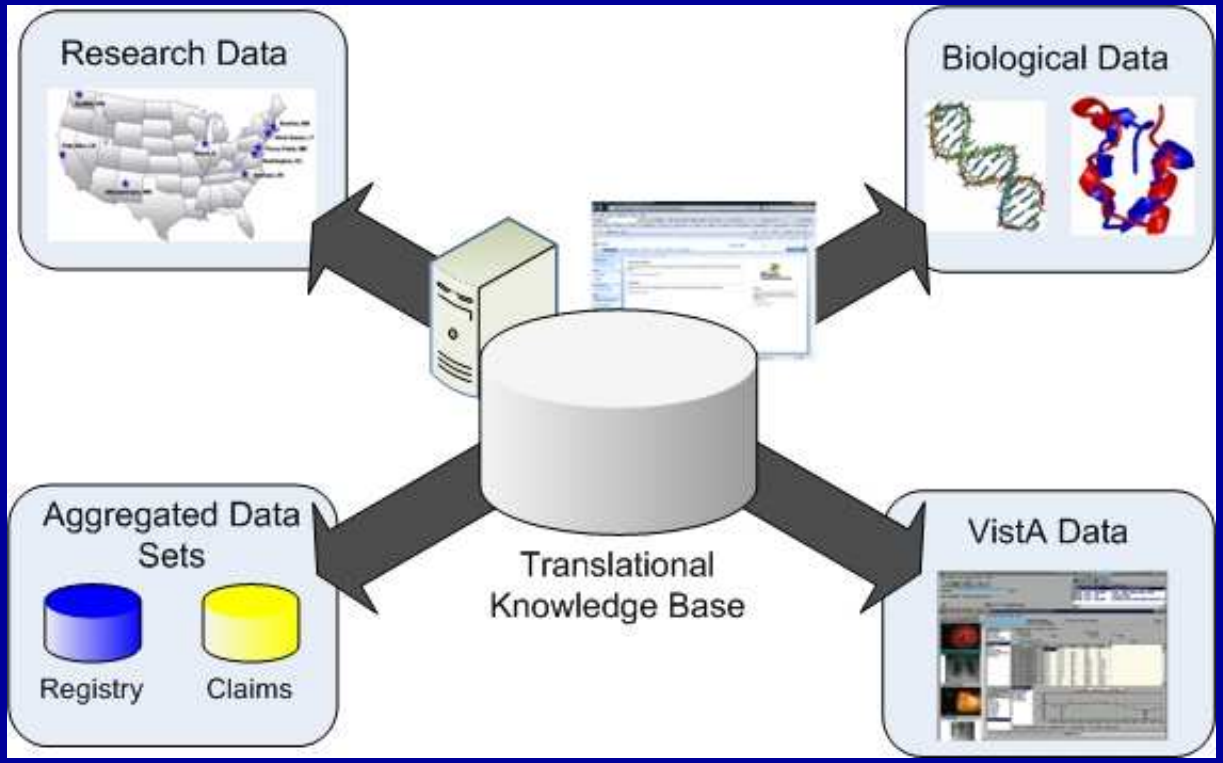
GenISIS

- Securely gather, integrate, and analyze patient information
- Facilitate discovery research through shared expertise
- Repurpose data and results for secondary analyses
- Validate genomic medicine findings
- Integrate findings into clinical medicine

GenISIS Vision Statement

- Short Term (Research focused):
  - To create and support a knowledge base that will facilitate independent research projects and allow for collaborative repurposing of data and results.
- Long Term (Patient care focused):
  - Integration of clinical care and research activities for improved patient outcomes and research efficiencies

GenISIS



Database, Query Interface, Analysis Environment, Governance

VINCI

Veterans' Informatics, iNformation, & Computing Infrastructure

VINCI Objectives

- Integrate existing data bases
- Integrate new data
  - Extracted information
  - Extracted meaning
- Provide a secure, high-performance computing environment
- Provide access to data
- Maintain customer support and outreach programs

Research Agenda

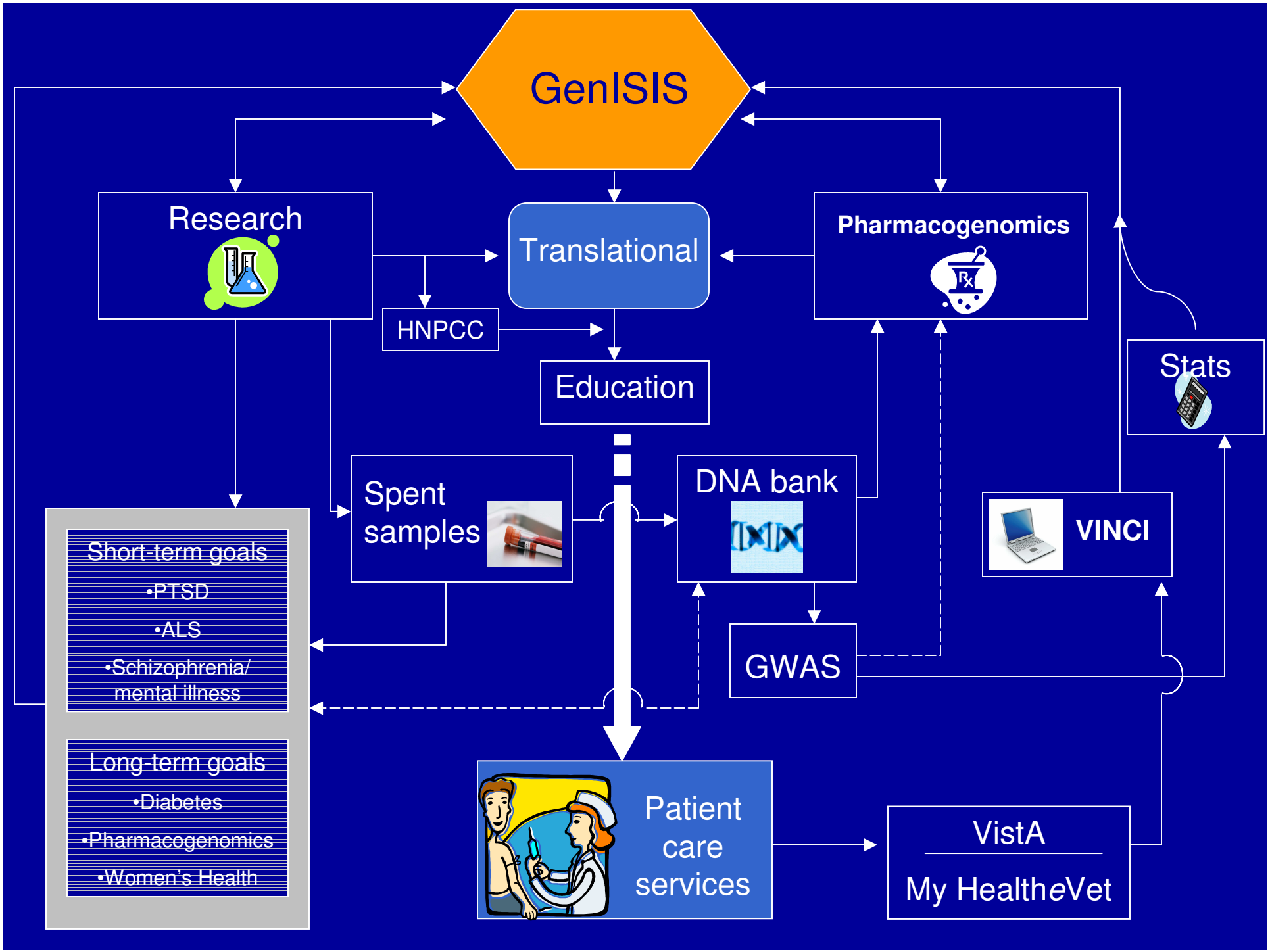
- Informed by healthcare needs of veterans
- GMPAC
- Scientific Advisory and Working Groups (HNPCC, endocrine tumors)
- Workshops
- Investigator initiated as well as Program directed

Genomic Research Projects

- Genetic epidemiology of ALS (ongoing)
- Genetics of PTSD (pilot funded)
- Serious mental illness cohort
  - Schizophrenia & Bipolar Disorder (in review)
  - Reference Cohort (pilot funded)
- Diabetes
- Pharmacogenomics

Ongoing Genomics/ Genetics-Related Projects

- VA funds 142 investigator-initiated Merit Review projects related to genetics/genomics
  - wide spectrum of conditions prevalent in veterans such as schizophrenia, PTSD, bipolar disorder, Alzheimer's, cardiovascular disease, diabetes, cancer (prostate, breast, colon, bladder, lung), substance abuse, stroke, chronic viral infections, autoimmune disorders, Gulf War Illness, etc.
  - Genetic-association, pharmacogenomics
  - Candidate gene analysis, SNP analysis, linkage studies, microarrays, siRNA, gene expression


GenISIS
Research
Translational
Pharmacogenomics
HNPCC
Education
Stats
Spent samples
DNA bank
VINCI
Short-term goals
•PTSD
•ALS
•Schizophrenia/ mental illness
GWAS
Long-term goals
•Diabetes
•Pharmacogenomics
•Women's Health
Patient care services
VistA
My HealtheVet

Challenges Going Forward

- Launching an integrated system to facilitate genomics research as well as translation to clinical care of veterans
- Governance and policy (access to samples and data etc)
- Education (effect on patient outcome; point of care tools)
- Interoperability

Education Initiative

- Development of educational programs and tools for physicians and other health professional
  - Collaboration between VA Employee Education Services and National Coalition for Health Professional Education in Genetics (NCHPEG)
  - Web-based tool for heritable colorectal cancer
    - Health-provider centric

Interactions With Other Organizations

- The VA interacts, discusses and actively participates in:
  - Pharmacogenetic Research Network
    - supported by several NIH Institutes
  - National Human Genome Research Institute (NHGRI)
  - The Institute of Medicine Roundtable on Translating Genomic-Based Research for Health
  - The American Health Information Community (AHIC) and AHIC Successor (AHIC2)
  - HHS and CDC- Family History Tool Working Group