An Overview of Health IT @ Kaiser Permanente

NIST Health IT Symposium Series – Gaithersburg, MD

April 15 2013

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NIST Health IT Symposium Series

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Topics

Our History, Model and Mission

Transforming Care through Health IT

Health IT-enabled Quality Improvement

Innovations and Telehealth/Telemedicine

Opportunities and Challenges Ahead

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How Americans Receive Their Medical Benefits

Employers	Medicare	Medicaid & State	Individuals	Uninsured

TODAY

Employers	Medicare	Medicaid & State	Individuals	Uninsured
149 M	48 M	69 M	11 M	49 M

2016

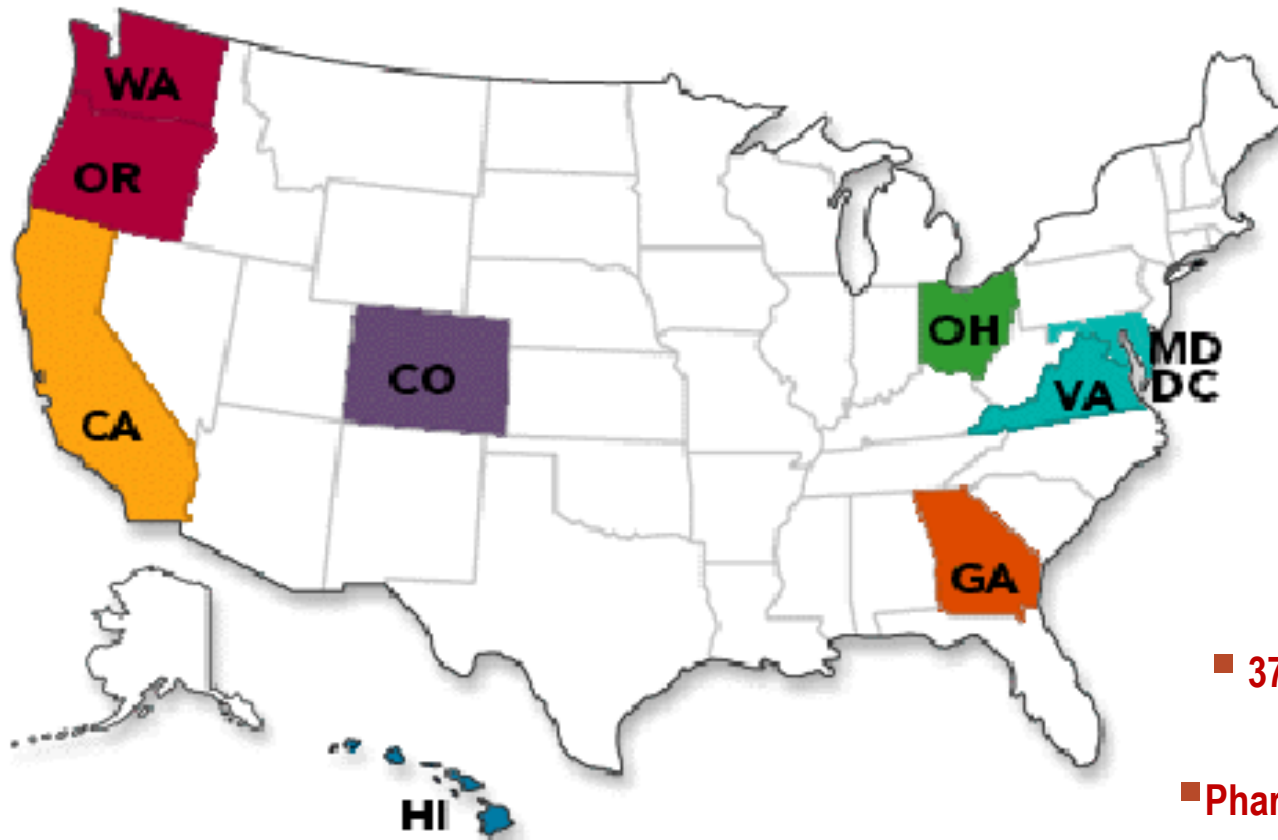| Employers	Medicare	Medicaid & State	Individuals	Uninsured
- 6 M	+ 6 M	+ 15 M	+ 15M	- 30 M
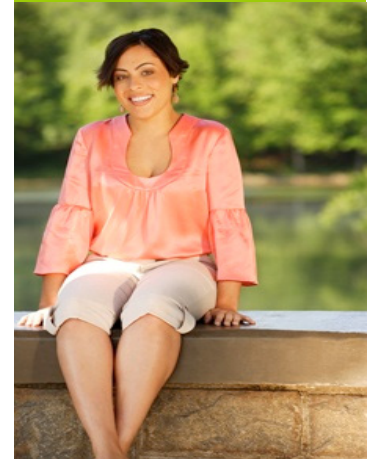
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Our History, Model, and Mission

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Kaiser Permanente by the Numbers

- Nation's largest nonprofit health plan
- Founded in 1945
- Integrated health care delivery System
- 9+ million members
- 17,000+ physicians, 48,000+ nurses
- 175,000+ employees
- 8 Regions Serving 9 states and the District of Columbia
- 37 hospitals and medical centers
- 650+ medical offices
- Pharmacies, Labs, Imaging Centers
- $50+ billion 2012 revenue

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From the Desert to the Shipyards

Kaiser Permanente was born out of the challenge of providing medical care during the Great Depression and World War II, when most people could not afford to go to the doctor.

- 1933: Dr. Sidney Garfield establishes a prepayment health plan for workers building an aqueduct in the California desert.

- 1938-45: Henry Kaiser persuades Dr. Garfield to set up a prepaid group practice plan for workers and their families, first at the Grand Coulee Dam construction site, then during World War II at Kaiser shipyards in California and Washington.

- 1945: Kaiser health plans are opened to the public in California, Oregon, and Washington.

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Innovative Ideas in a Fee-for-Service World

- Prepayment

- Group practice

- Prevention/total health

- Population-based approach

- Clinical information technology

Photo: Sidney Garfield, MD (left):
Surgeon, visionary, and trailblazer

Henry Kaiser (right): An entrepreneur who
revolutionized ship-building and started global
enterprises, including cement, steel, aluminum,
and automobiles

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Our Mission and Vision

Mission: to provide high-quality, affordable health care services and to improve the health of our members and the communities we serve.

Vision: To be a leader in Total Health by making lives better.

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Our Blue Sky Vision

Four Core Elements:
- Total health, patient-centered, connected care
- Integrated/coordinated vs independent/fragmented
- Prepaid vs Fee-for-service
- Common, interoperable EHR system vs incompatible/disconnected systems

Home as the Hub
Focus on patient needs
The home, and other settings, will grow significantly as a locale of choice for some care delivery
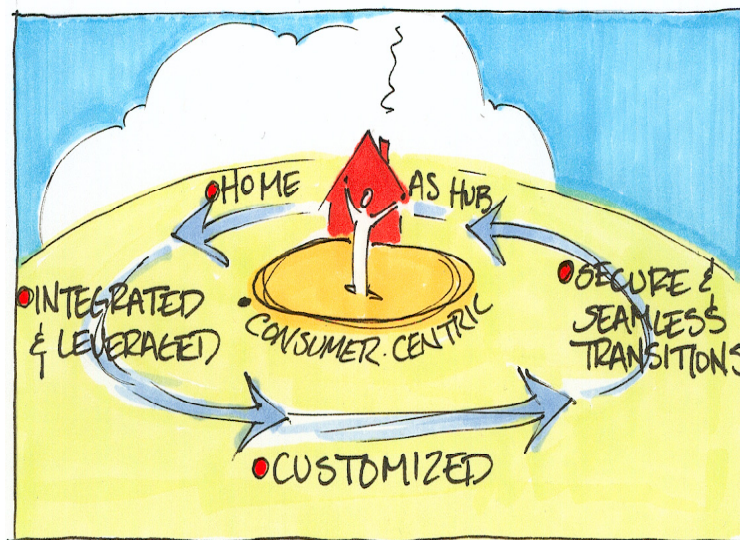
Integration and Leveraging
IT functionality enables us to leverage scarce or specialized clinical resources - MDs, RNs and other clinical staff and make our processes more efficient.
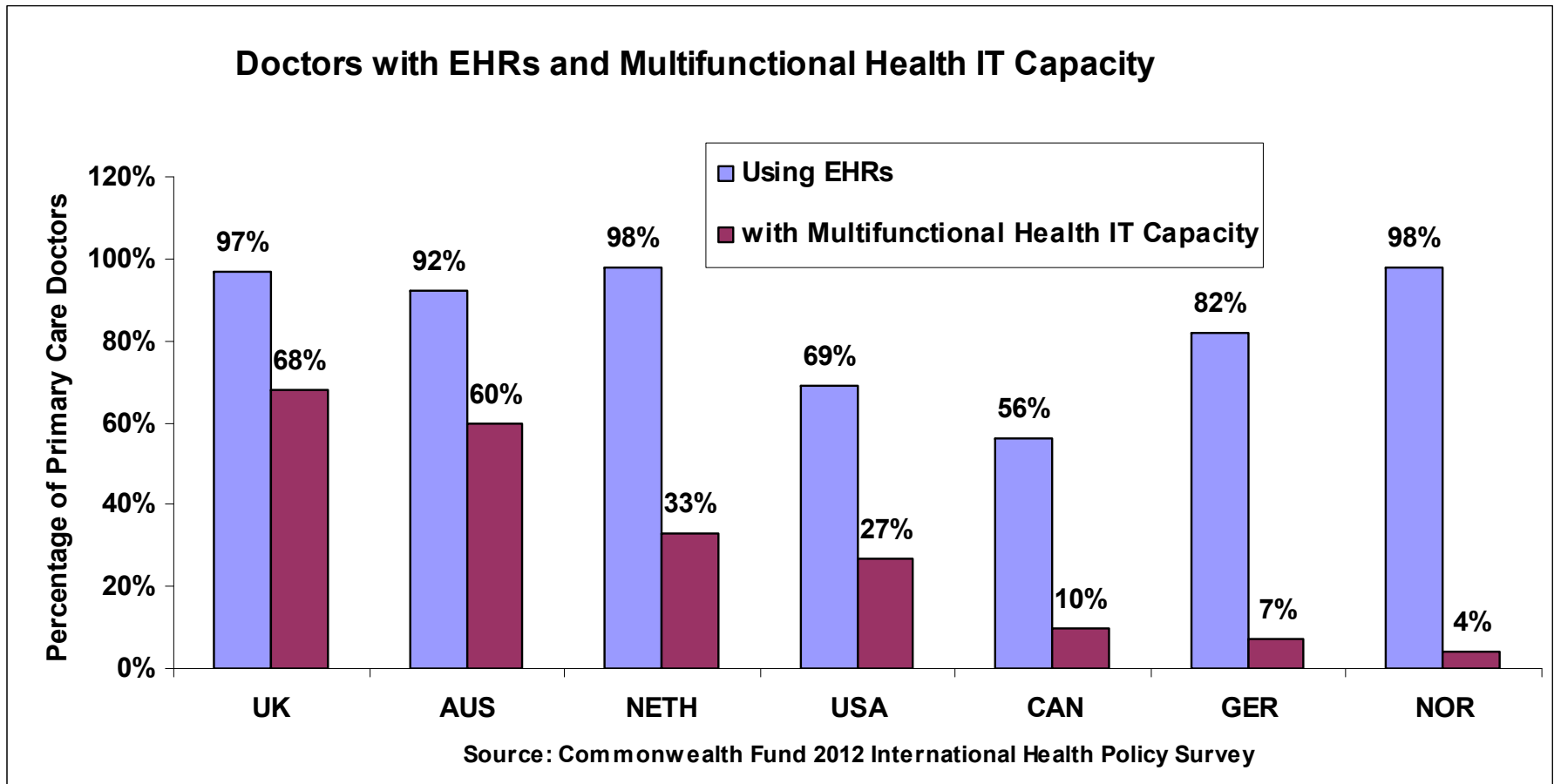
Secure and seamless transitions
'Warm Handoffs' - The human skill sets and operational processes to deliver care and service effectively, efficiently, and compassionately.
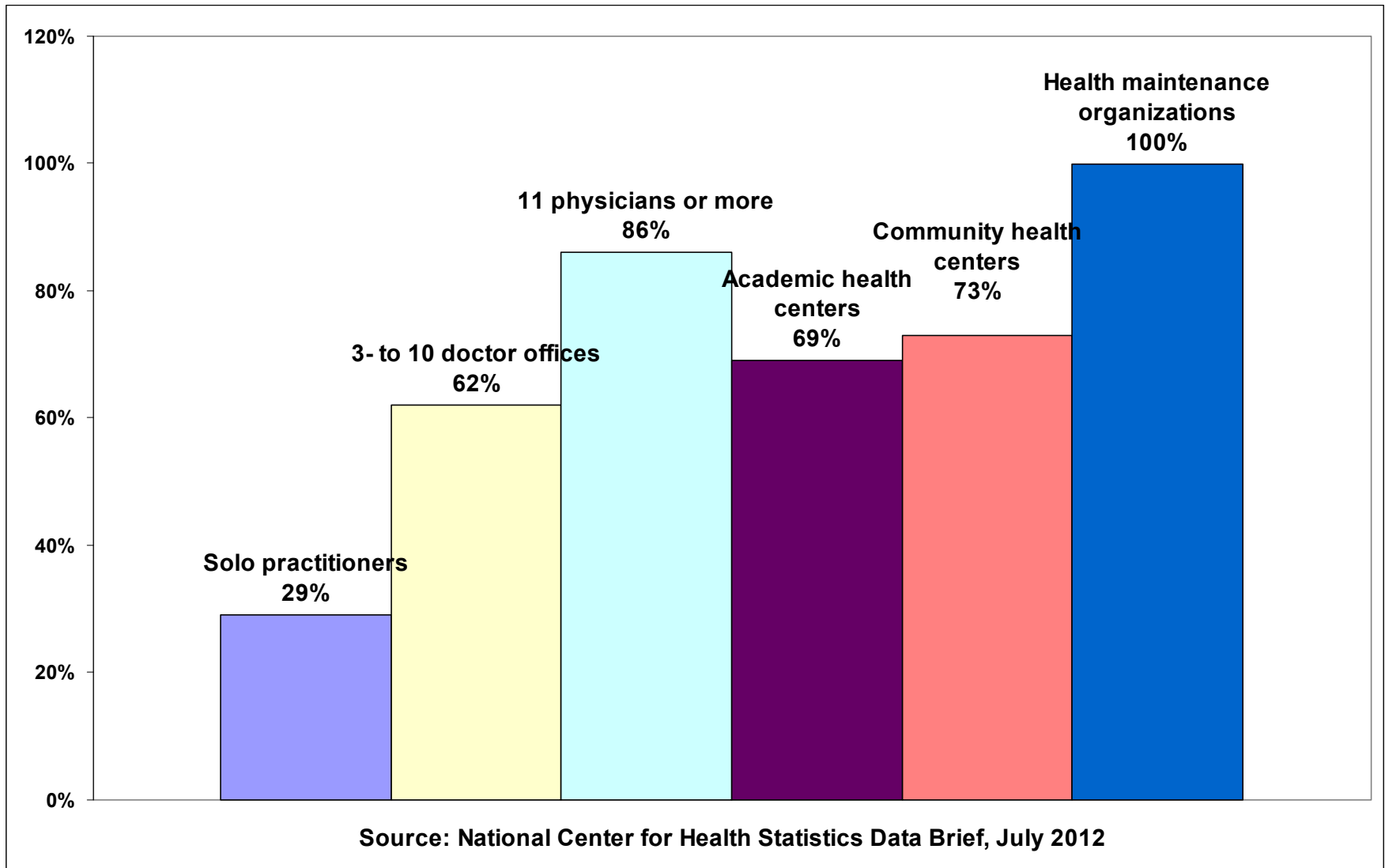
Customization
Occurs at any level of the members' journey with KP

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Transforming Care through Health Information Technology

Where is the US in the Health IT Adoption?

Doctors with EHRs and Multifunctional Health IT Capacity

Legend:
- Using EHRs
- with Multifunctional Health IT Capacity

Y-axis: Percentage of Primary Care Doctors (0% – 120%)

Country	Using EHRs	with Multifunctional Health IT Capacity
UK	97%	68%
AUS	92%	60%
NETH	98%	33%
USA	69%	27%
CAN	56%	10%
GER	82%	7%
NOR	98%	4%

Source: Commonwealth Fund 2012 International Health Policy Survey

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U.S. EHR Adoption by Practice Setting, 2011

Bar chart showing EHR adoption percentages:
- Solo practitioners: 29%
- 3- to 10 doctor offices: 62%
- 11 physicians or more: 86%
- Academic health centers: 69%
- Community health centers: 73%
- Health maintenance organizations: 100%

Source: National Center for Health Statistics Data Brief, July 2012

Our Investment in Health IT
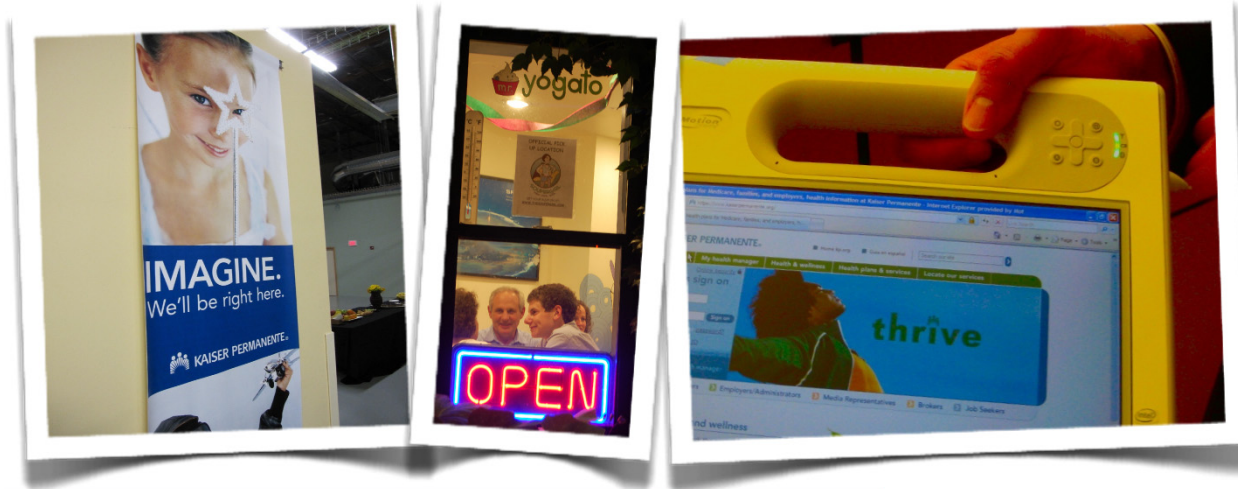
"…the right information about the right patient available to the right provider all the time…"

Kaiser Permanente Health IT:

- Combination of tools, resources, processes and workflows working together in an integrated environment to deliver high-quality affordable health care

- A program-wide system that integrates the clinical record with population management, patient/consumer interface, telehealth, administrative and consumer support systems

Kaiser Permanente HealthConnect®

- The world's largest and one of the most advanced civilian deployments of an electronic health record

- KP HealthConnect was implemented specifically to transform care and service delivery

- Our greatest benefits are the resulting improvements in quality, effectiveness, efficiency, safety, and support for new health delivery model

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Kaiser Permanente Health IT

- **HealthConnect ® Electronic Health Record System**

- **Member/Patient Portal**

- **Clinical Decision Support and Population Management**

- **Interoperability - Standards - Terminology**

- **Health Information Exchange, CCC, CIMI**

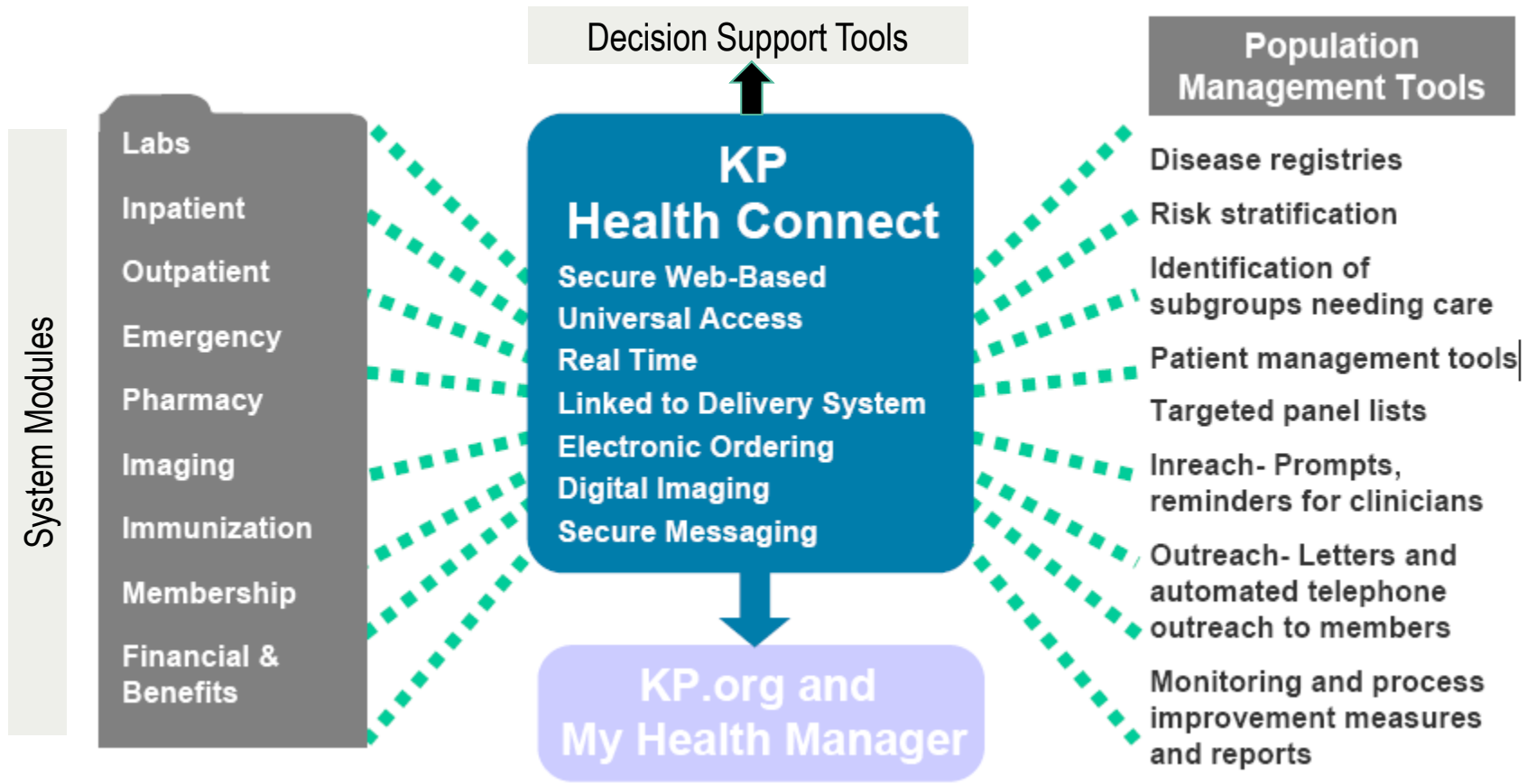- **Health IT-enabled Quality Improvement**

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Kaiser Permanente HealthConnect

Kaiser Permanente typically spends about 5% of our total revenue on information technology. KP HealthConnect (our integrated system for care delivery) is:

- More than just an electronic medical record

- A Program-wide system that integrates the clinical record with appointments, ancillary and specialty services, registration, and billing

- A complete health care business and management system that enhances the quality of patient care

- A personal health record for more than 4 million Kaiser Permanente members (60% of members over 13 with Internet access)

Note: *Return on investment was estimated at 8.5 years (but this was a strategic investment, not based on ROI)*

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Kaiser Permanente HealthConnect

Linking across patient episodes, providers, settings

Decision Support Tools

Population Management Tools

System Modules

Labs

Inpatient

Outpatient

Emergency

Pharmacy

Imaging

Immunization

Membership

Financial & Benefits

KP Health Connect

Secure Web-Based
Universal Access
Real Time
Linked to Delivery System
Electronic Ordering
Digital Imaging
Secure Messaging

KP.org and My Health Manager

Disease registries

Risk stratification

Identification of subgroups needing care

Patient management tools

Targeted panel lists

Inreach- Prompts, reminders for clinicians

Outreach- Letters and automated telephone outreach to members

Monitoring and process improvement measures and reports

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kp.org and myHealthManager

Health Services More Accessible

- **Appointment Manager**
- **Renew prescription orders**
- **Access to lab results**
- **Special conditions (i.e., allergies, medications)**
- **Email with providers**
- **Access to medical record information (problem lists, medical history, immunizations, tests, etc)**
- **Download health record ("Blue Button")**
- **Tools to select providers, locate services**
- **24x7 Call Center**

Wellness and Engagement

- **Health encyclopedia online**
- **Access to HealthWise Manual**
- **Health Calculator**
- **Tools for self-evaluation of health conditions**
- **Announcements**
- **Educational programs**
- **Healthy Living educational modules**

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KP App - Anytime, Anywhere Access
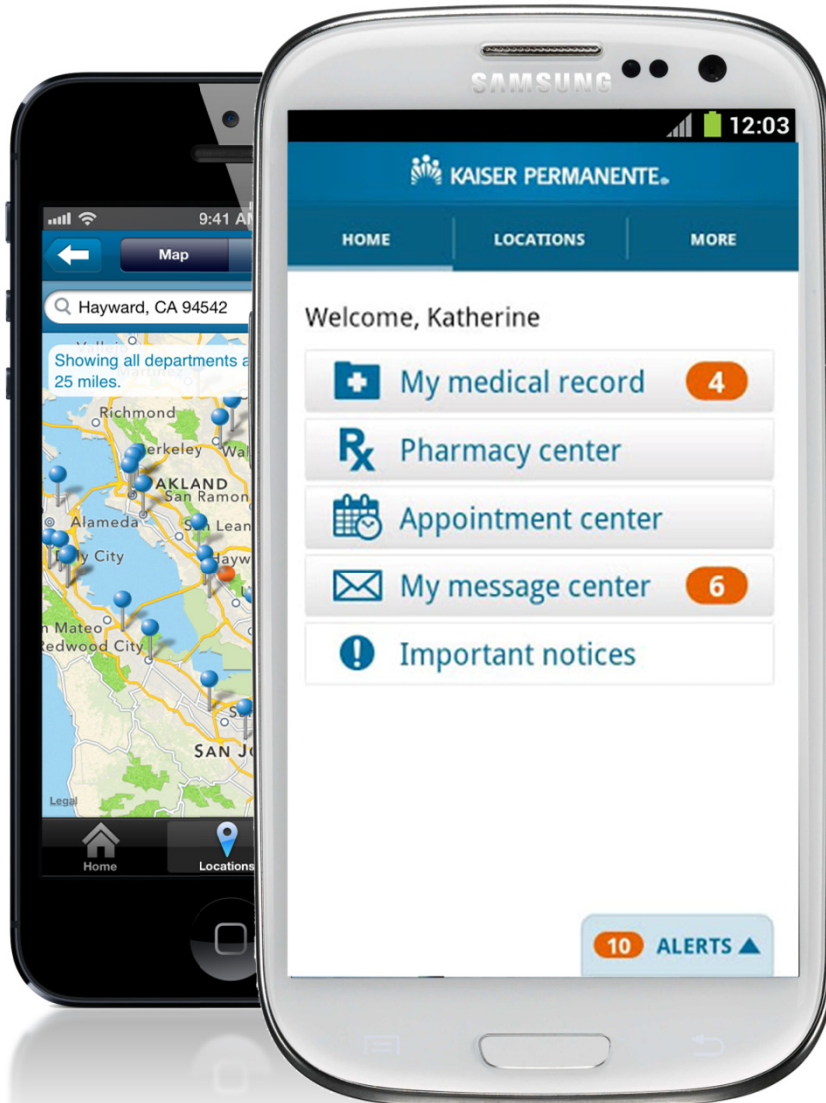
53% of U.S. adult cell phone owners have smartphones.

One in three cell phone owners have used their phone to look for health information.

The KP app can help you:
- locate facilities
- access medical records
- refill prescriptions
- make appointments
- email caregivers
- view test results

Pew 2012 Mobile Health Survey

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Clinical Decision Support and Population Management Tools

- Access to library of KP knowledge and best practices at the point of care
- Tools and templates that facilitate the delivery of evidence-based medicine
- Dynamic decision-support tools that enhance quality and patient safety
  - Drug-Drug Interactions Alerts
  - Drug Allergy Alerts
  - Best Practice Alerts
  - Health Maintenance Reminders
  - Alternative Order and Medication Alerts
- Proactive alert and notification system

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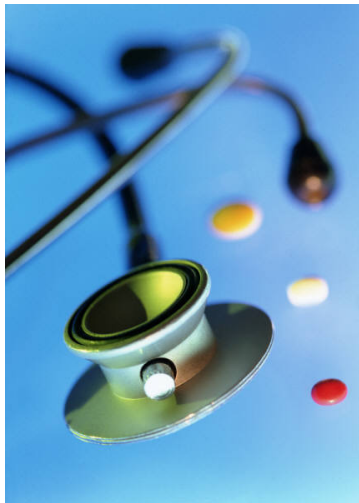
Population Management and Panel Support Tools

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Demo Site

getting started | updates | FAQs | user guide | glossary | contact us

The Panel Support Tool

choose a provider | search / panel view | visit info | risk factors | logout

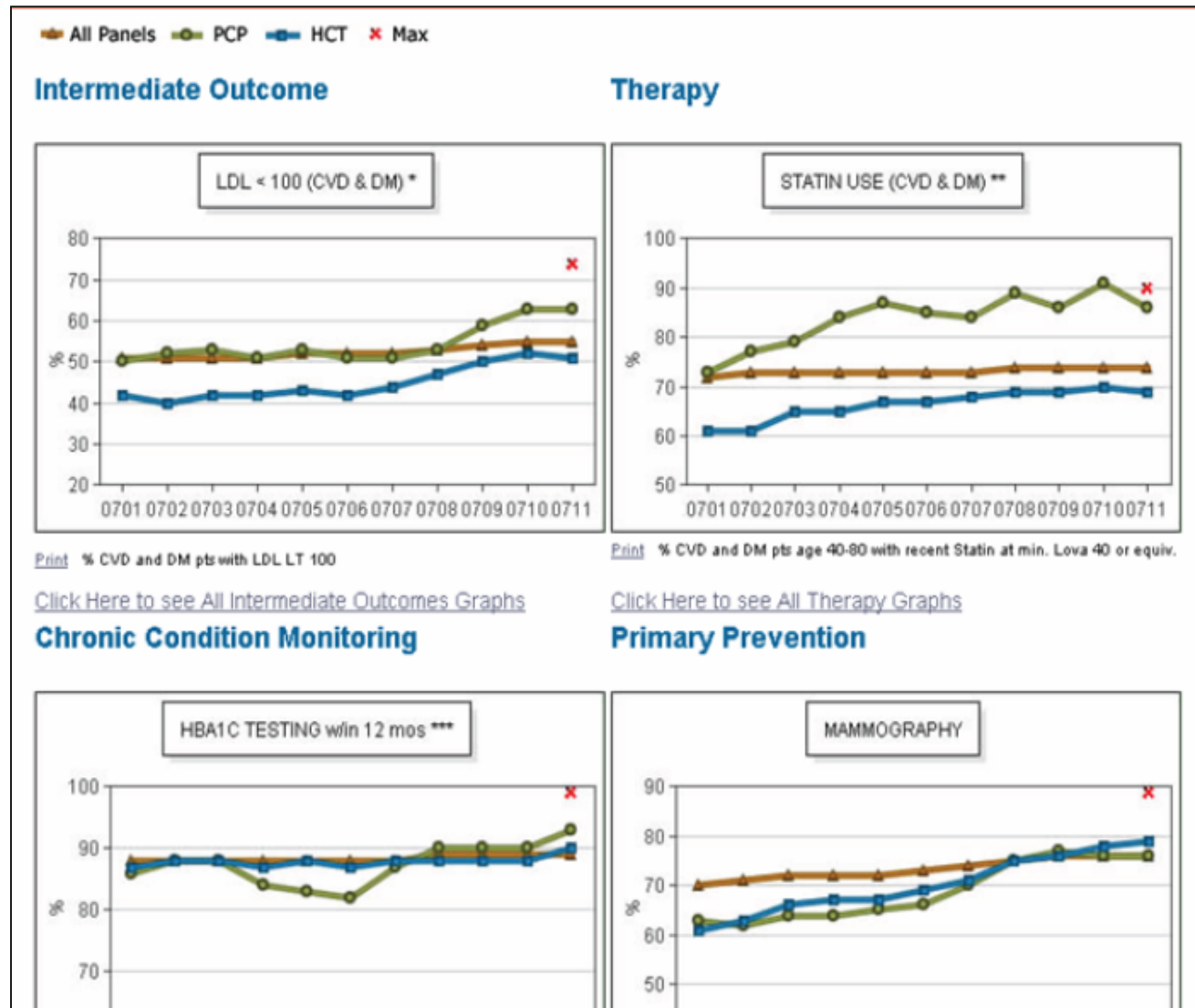PCP: DEMO DOC   Panel Size : 1158   Y Indicates in the registry

Report	MRN	NAME	Age	Sex	Prev	Gap	DM	CVD	CHF	HTN	CKD	Last Seen	Rev'd
☐	000000027	DEMO27	76	F		20	Y				Y		3/23/2006
☐	000000455	DEMO455	39	M		17	Y			Y	Y		
☐	000000370	DEMO370	50	F		17	Y			Y	Y	12/16/2004	
						17	Y						
						17	Y			Y	Y		
						16	Y			Y			
						14	Y	Y	Y	Y	Y	7/6/2005	3/22/2006
						12	Y			Y	Y	3/13/2006	
						12		Y		Y		4/13/2005	
						12	Y				Y	7/16/2005	
						11		Y		Y		7/29/2004	
						11	Y			Y		2/28/2006	
☐	000000746	DEMO746	58	F		10	Y			Y		12/27/2005	
☐	000000080	DEMO80	55	M		10	Y			Y		1/26/2005	
☐	000000989	DEMO989	85	F		10		Y	Y	Y		5/25/2004	
☐	000000559	DEMO559	79	F		10	Y			Y	Y	9/3/2005	

Panel Support Features

- Tools to support the systematic analysis and management of all patients assigned to a providers using national guidelines

- Effective in managing and improving the health of predefined population and sub-population groups, the short- and long-term quality of services, and the improvement of service coordination and continuity of care

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Population Management and Panel Support Tools

- Tools include interactive, real-time graphic display of 'vital signs' of a provider's panel

- Comparative analysis of results

- Different levels of specificity of indicators

Panel Support Tools for Specialists

Standards and Interoperability

- KP has always been at the forefront of development, adoption and use of health IT standards

- Currently actively engaged in most national and international SDOs including ISO, HL7, ASTM, DICOM, X12, NCPDP, NQF, others

- Applied across entire spectrum of programs and services (clinical, labs, pharmacy, imaging, administrative, research, etc)

- Developed Convergent Medical Terminology (CMT) tool to cross-reference multiple clinical terminologies

- Engaged in additional multi-lateral efforts to advance interoperability

    - Clinical Information Modeling Initiative (CIMI)

    - Care Connectivity Consortium (CCC)
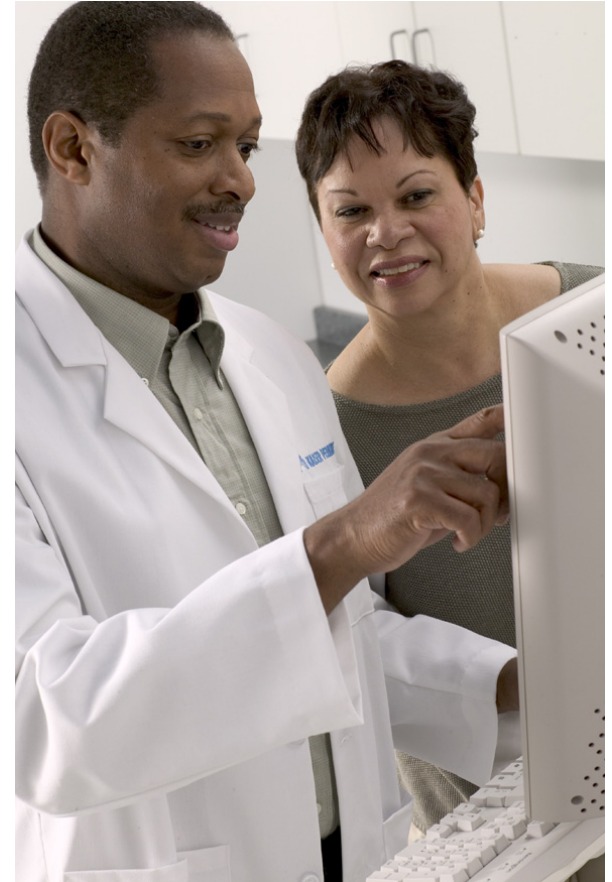
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What is Interoperability?

Technical

'Technical' Interoperability
The ability of two or more systems to reliably exchange information so that it is human readable by the receiver.

Technical interoperability describes the actual, physical puzzle pieces and their ability to be linked.

Semantic

'Semantic' Interoperability
The ability of information shared by systems to be understood... so that non-numeric data can be processed by the receiving system.

Semantic interoperability describes the image printed on the puzzle and the picture's ability to convey information to people.

Process

'Process' Interoperability
Focuses on methods for the optimal integration of computer systems into actual work settings.

Process interoperability describes the methods and strategies used by those assembling the puzzle, perhaps grouping pieces with straight sides, grouping pieces by color, etc.

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Our Vision of Interoperability

With an industry-leading, at-scale connected system, Kaiser Permanente is seeking to define transformational connections across our enterprise, with our members and the nation.

Connecting Kaiser Permanente — "a modern health care system"
- KP HealthConnect
- Integrated ancillary systems
- Infrastructure foundation

Connecting The World — "a global impact"
- Personal data
- International standards
- Clinical Medical Terminology

Connecting Members & Customers — "Patient-Centered Focus"
- KP.org
- Telehealth
- Mobile Applications

Connected Health

Connecting The Nation — "a national system"
- Care Connectivity Consortium
- Virtual Lifetime Electronic Record
- Social Security Administration

Connecting Our Communities — "community partnership"
- Safety net sponsorship
- Regional/local exchanges

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Standards and Interoperability

U.S. National Library of Medicine
National Institutes of Health
NLM

Contact NLM

Search

Databases | Find, Read, Learn | Explore NLM | Research at NLM | NLM for You

The World's Largest Medical Library

Unified Medical Language System® (UMLS®)

UMLS Quick Start Guide | FAQs | Customer Support | UMLS Site Map

Home > Biomedical Research & Informatics > UMLS

Kaiser Permanente Opens Access to CMT to Support HHS Health IT Goals

What is CMT?

- CMT stands for Convergent Medical Terminology. It is a set of clinician- and patient friendly terminology, linked to US and international interoperability standards, and related vocabulary development tools and utilities. It was developed by Kaiser Permanente over many years for use within its health-IT systems. CMT includes more than 75,000 concepts.

- CMT can be incorporated in the underlying architecture of health-IT systems to support data flow between health care providers, as it is in Kaiser Permanente today. It provides uniform concept definitions so that systems used for labs, vaccines, observations, and other medical data can communicate with each other in a common language, making data transferable between systems and among care teams.

- CMT allows care teams to interact with health information technology systems by providing more familiar names and descriptions so that they can coordinate with each other in an easy to understand way.

- Because CMT links to U.S. national standard vocabularies and code sets, such as SNOMED CT and ICD-9-CM, health data created using CMT's clinician-friendly language can be translated as needed to standards required for quality measurement, statistical reporting, and health care reimbursement.

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Standards and Interoperability Drivers and Challenges

DRIVERS

- HIPAA

- Meaningful Use

- Health Reform

  - Insurance Reform: Health Insurance Exchanges

  - Care Delivery Reform: Care Coordination, Seamless Transitions of Care

  - Payment Reform: Performance/outcomes based bundled payments

CHALLENGES

- Rigidness vs flexibility

- Required vs situational

- Benefits vs Risks

- Multiplicity of disjointed requirements

HITECH EHR Incentive Program (Meaningful Use)

- MU serves as a great impetus to further improve health care quality, service and safety
- Financial incentives are resulting in significant increase in national health care system's adoption of EHRs
- KP actively prepared for MU, reached out to regulators to offer perspectives, and is exceeding requirements into areas beyond MU
- Because Kaiser Permanente has invested heavily in health IT over many years, we are well-positioned to meet meaningful use objectives -- but not without hard work and dedication
- Like other health care providers, we have to look at our technologies with fresh eyes and examine ways to make it more meaningful
- We are now focusing on achieving full compliance with the next MU milestone (Stage 2)
- We believe that this work and the investment in HIT is important and will change the way each and every person receives health care in the future

Health Information Exchanges

As HIE evolves, the interoperability framework standards advance for reliable exchange and data integration across the nation.

No EMR	EHR	Direct Email	Exchange Interoperability
MDs, RNs Fax · Paper Records	Patients · MDs, RNs Hospitals, MOBs · Health Plans	Direct Email	Semantic · Technical · Process
Non-interoperable medical records sent via fax or email	Electronic records contained within various health care sites and organizations	Directed push using secure email transport over the Internet	Advanced interoperability components using national eHealth standards

Care Connectivity Consortium (CCC)

- Five founding organizations

- Enhance the capabilities of current HIE technologies

- Allow for secure and effective sharing between data exchange networks and health record systems

- Offer these solutions to the broader HIE community

CCC Background

Innovation: Value Added Services Development (augment eHealth Exchange standards)

Care Connectivity Consortium

Healtheway/CCC Value Added Services Collaboration

March 2011
- Formed CCC Health Information Exchange network

February 2012
- Signed Participant Trust Agreement to enable network exchanges
- Live on CCC Health Information Exchange network, using national standards

August 2012
- Expanded content: added lab results, immunizations, & vital signs

December 2012
- Completed initial development of patient matching & consent management services

Care Connectivity Consortium

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What's not working today….

The eHealth Exchange provides a foundation for interoperability – however challenges exist for patient matching and consent management.

Patient Information
NAME: Jane Doe
DOB: 05/05/1973
GENDER: Female
ADDRESS: 1721 E Glider LN
Murray, UT 84020
CONSENT: YES

Jane Doe?

Patient Discovery

Patient Information
NAME: Jane Doe
DOB: 05/05/1973
GENDER: Female
ADDRESS: 1721 E Glider LN
Murray, UT 84020
CONSENT: NOT ON FILE

50% Matching Failure Rate*

False Negatives (No Match)
- No consent on file?
- Multiple Matches?
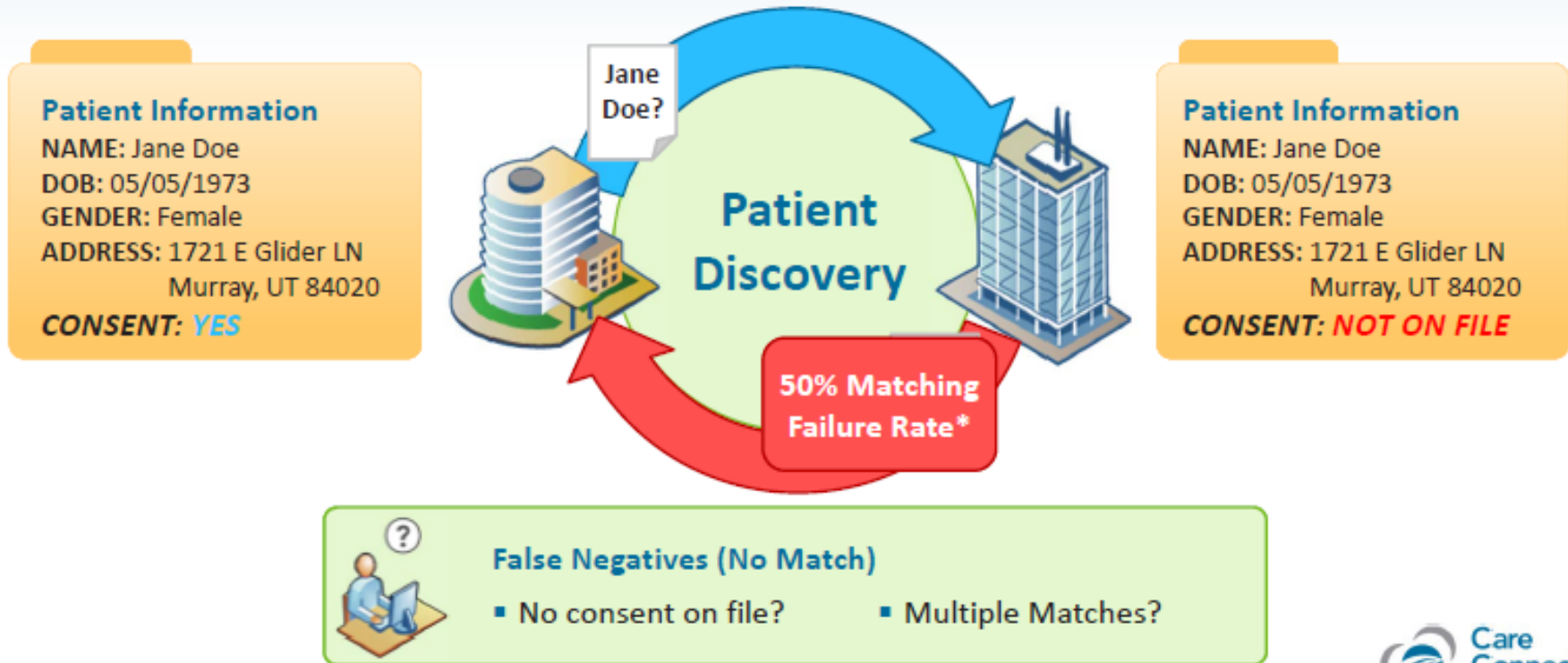
* Estimated Based on Industry Studies and CCC Organization experience to date (2013)

Care Connectivity Consortium

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What we are achieving

The CCC will offer Value Added Services to augment the foundation of trusted data exchange technology on the eHealth Exchange network.

Value Added Services		Desired Outcomes
Patient Identity Management Services	→	Higher Patient Matching Success Rate
Enhanced Consent Management	→	Consent Management at Point of Service
CCC Integration Portal	→	Improved HIE workflows
CCC Learning Lab	→	Innovation Incubator

CCC Integration Portal

CCC Value Added Services

CCC Learning Lab

Federal Partners

40+ Providers

eHealth

CCC Members

Care Connectivity Consortium

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Next Steps

CCC value-added services provided to eHealth Exchange participants via Healtheway

CCC Integration Portal

Enhanced Consent Management

Controlled Broadcast

Record Locator Services

Patient Identity Management Services

CCC — eHealth Exchange (Powered by Healtheway)

Exchange Foundation

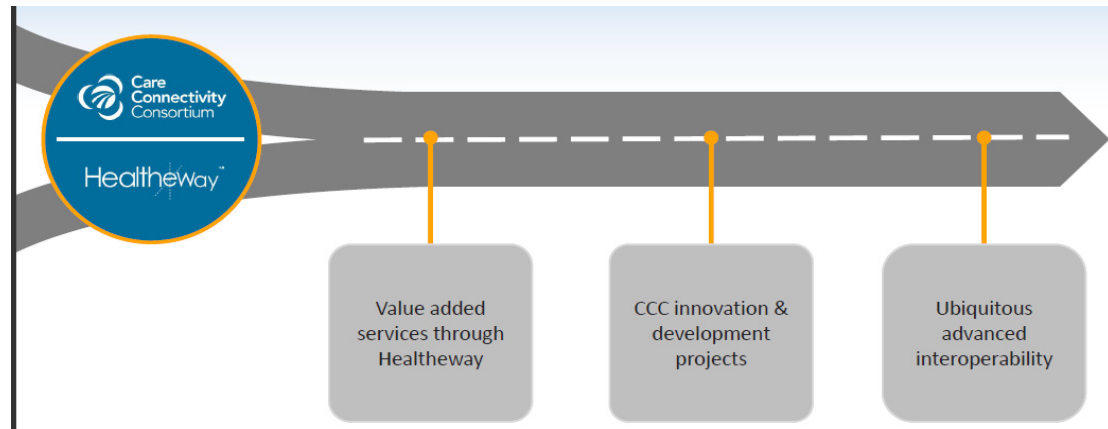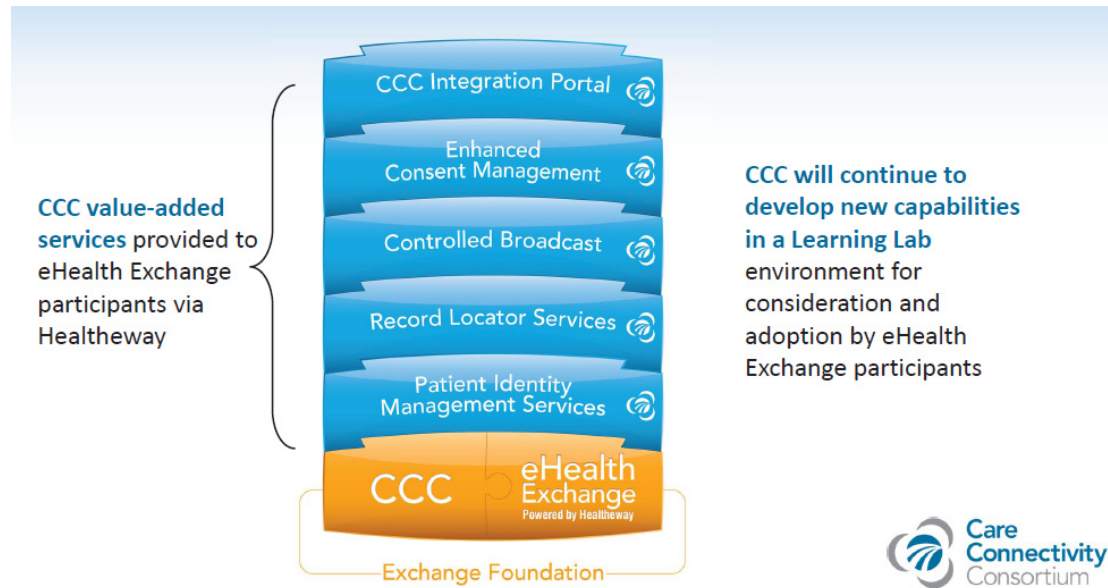CCC will continue to develop new capabilities in a Learning Lab environment for consideration and adoption by eHealth Exchange participants

Leverage CCC's development and incubation of new services for the exchange

Leverage Healtheway's robust onboarding and associated services to help minimize costs and improve efficiencies

Value added services through Healtheway

CCC innovation & development projects

Ubiquitous advanced interoperability

Clinical Information Modeling Initiative (CIMI)

CIMI is an international collaboration dedicated to providing a common information modeling format to represent health information content for interoperability.

- Shared repository of detailed clinical information models

- Using a single formalism

- Based on a common set of base data types

- Formal bindings of the models to standard coded terminologies

- Repository is open and models are free for use at no cost
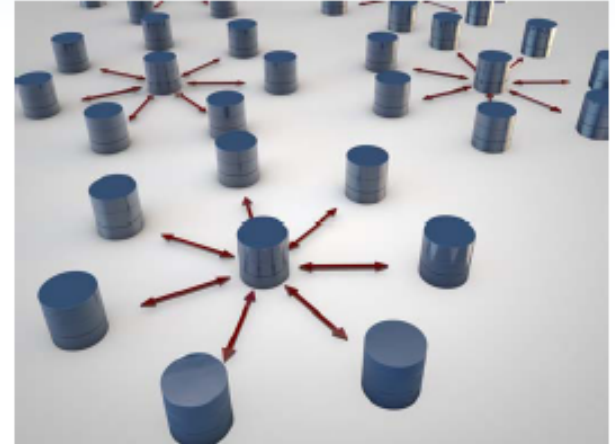
Mission
Improve the interoperability of healthcare systems through shared implementable clinical information models.

Common formats would enable the integration, analysis, and interoperability across healthcare disciplines and institutions.

- Messages
- Services
- Decision logic (queries of EHR data)
- EHR data storage
- Clinical trials data (clinical research)
- Normalization of data for secondary use
- Creation of data entry screens
- Natural Language Processing

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Clinical Information Modeling Initiative (CIMI)

- CEN 13606
- openEHR Foundation
- US Veterans Administration
- US Department of Defense
- Intermountain Healthcare
- Mayo Clinic
- HL7
  - Version 3 RIM, message templates
  - TermInfo
  - CDA plus Templates
  - Detailed Clinical Models
  - greenCDA
- Tolven
- NIH/NCI – Common Data Elements, CaBIG
- CDISC SHARE

Health-IT Enabled Quality Improvement

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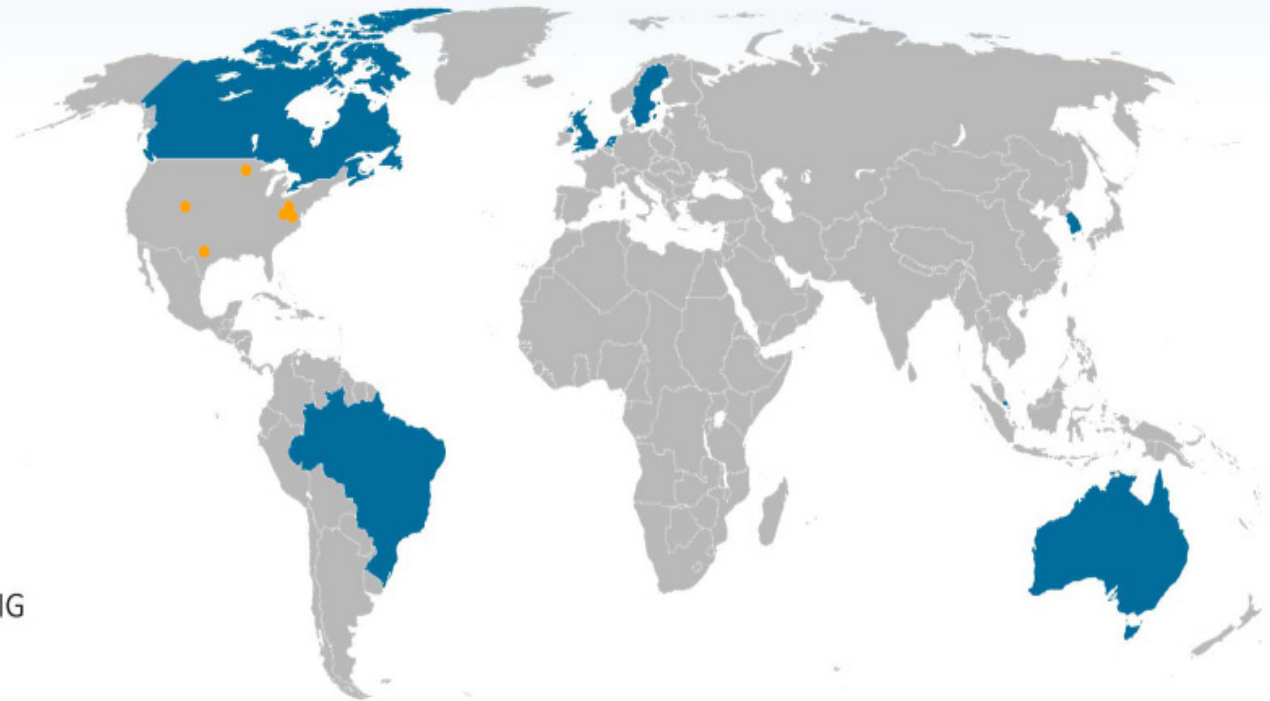
Examples of Quality Improvement

- We have reduced mortality from sepsis infections by 40%.

- Our Healthy Bones program has reduced broken bones for our senior patients by nearly one-third.

- The death rate for our HIV patients is half the national average, due to our highly effective HIV team care programs.
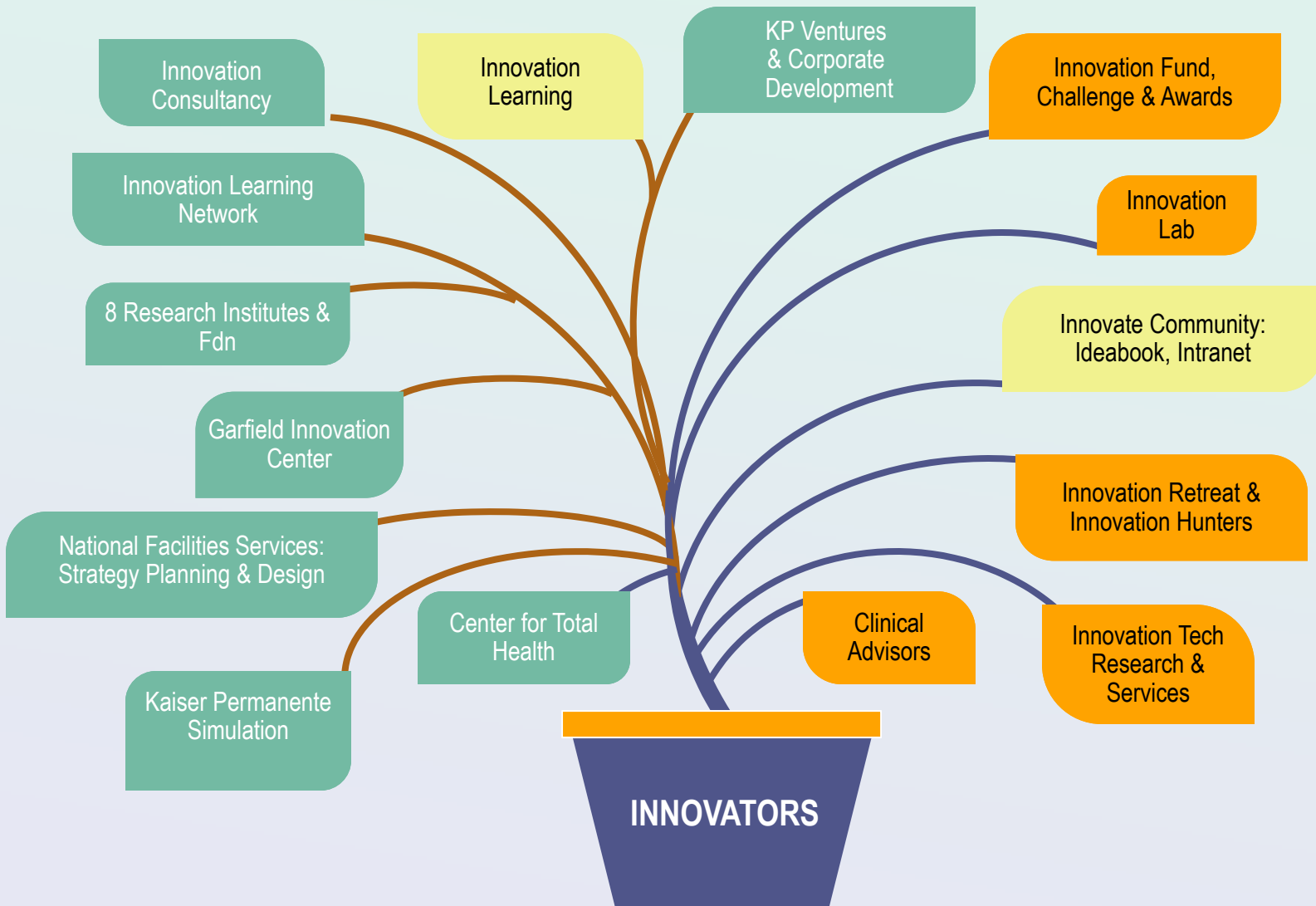
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Examples of Quality Improvement

- **HIT-Enabled Diabetes Care** [1]
  - 44% lower failure rate of metformin treatment for type 2 diabetes

- **HIT-Enabled Cholesterol Management** [2]
  - 40% more very high risk patients achieve national cholesterol guidelines

- **HIT-Enabled Screening** [3]
  - Best breast cancer screening rates in US
  - Best HIV/AIDS screening rates in US

- **HIT-Enabled Cardiac Care** [4]
  - 24% lower probability of death from heart attack
  - 62% lower probability of serious heart attacks doing permanent damage
  - 90% lower mortality from second heart attacks
  - 89% lower all-cause cardiac mortality

- **HIT-Enabled Patient Satisfaction** [5]
  - Higher patient involvement in care
  - Over 800% more scheduled e-visits
  - Almost 600% more secure messaging with doctors
  - 24% fewer office visits

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References

1 Secondary Failure of Metformin Monotherapy in Clinical Practice; Jonathan B. Brown, Christopher Conner, and Gregory A. Nichols ; *Diabetes Care* March 2010 volume 33 number 3

2 Attainment of Low-Density Lipoprotein Cholesterol Goals in Coronary Artery Disease; Amy B. Kauffman, Kari L. Olson, Morgan L. Youngblood, Emily B. Zadvorny, Thomas Delate, John A. Merenich, Clinical Pharmacy Cardiac Risk Service Study Group et al. ; *Journal of Clinical Lipidology* May 2010 Volume 4, Issue 3

3 NCQA 2008 Quality Compass ® , Healthcare Effectiveness Data and Information Set (HEDIS) ; National Committee on Quality Assurance ; see also subsequent years' HEDIS.
   Development of National and Multiagency HIV Care Quality Measures ; Michael Horburg; *Institute of Medicine, Board on Population Health and Public Health Practice* , Testimony, February 28, 2011

4 Collaborative Cardiac Care Service ; Brian G Sandhoff, Susan Kuca, Jon Rasmussen, John A Merenich ; *Permanente Journal*, 2008 Volume 12 Number 3 ; See also, *James A Vohs Award for Quality*, 2007 and 2009
   Preventing Myocardial Infarction and Stroke With a Simplified Bundle of Cardioprotective Medications; R. James Dudl, MD; Margaret C. Wang, PhD, MPH; Michelle Wong, MPH, MPP; and Jim Bellows, PhD ; *American Journal of Managed Care*. 2009;15(10)
   Population Trends in the Incidence and Outcomes of Acute Myocardial Infarction; Robert W Yeh, Stephen Sidney, Malini Chandra, Michael Sorel, Joseph Selby ; *New England Journal of Medicine 2010* ; June 10, 2010; 362: 2155-2165

5 Transforming and Streamlining Modalities of Care; Catherine Chen, Terhilda Garrido, Don Chock, Grant Okawa, Louise Liang ; *Health Affairs ;* March/April 2009, Volume 28, Number 2

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Innovations and Telehealth/Telemedicine @ Kaiser Permanente

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Kaiser Permanente Innovation Ecosystem

Innovation Consultancy

Innovation Learning

KP Ventures & Corporate Development

Innovation Fund, Challenge & Awards

Innovation Learning Network

Innovation Lab

8 Research Institutes & Fdn

Innovate Community: Ideabook, Intranet

Garfield Innovation Center

Innovation Retreat & Innovation Hunters

National Facilities Services: Strategy Planning & Design

Center for Total Health

Clinical Advisors

Innovation Tech Research & Services

Kaiser Permanente Simulation

INNOVATORS

Sidney R. Garfield Health Care Innovation Center

- **37,000 sq. ft. simulated care delivery environment for testing new ideas and designs**
  - Located in San Leandro near Oakland Airport
  - Funded internally by Kaiser Permanente
  - Opened 2006

- **Space includes:**
  - Inpatient clinical mockups
    - Full sized med/surgery unit & patient rooms
    - Labor, delivery, recovery & postpartum setting
    - Operating room
    - ED treatment bay
  - Outpatient clinical mock ups
  - Home health environment
  - IAT technology laboratory
  - Open prototyping area
  - Learning & conference space

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Telehealth/Telemedicine @ Kaiser Permanente

- **Vision**
  - Telehealth is an integral part of the way Kaiser Permanente delivers comprehensive, high-quality, accessible, convenient, and affordable health care to its health plan members

- **Goals**
  - Expand the geographical and operational boundaries of health care by leveraging technology to connect health plan members and health care providers with each other
  - To provide remote health care, educational, and administrative services to members wherever they may be.

Principles

1. **Member-centric**. Telehealth recognizes members' needs, preferences, desires, and the importance of member participation in care decisions and activities.
2. **Evidence-based best practice**. Telehealth programs are based upon proven benefits in quality of care, service, affordability, and/or professional satisfaction.
3. **Right technology**. Telehealth technology should be robust, reliable, affordable, secure, and appropriate to the abilities, constraints, and preferences of its users.
4. **Right people**. Telehealth is a collaborative, multidisciplinary approach that must have the full commitment of participating health care providers.
5. **Right process**. There should be providers tasked with monitoring and acting upon telehealth data, as well as coordinating member care.
6. **Broad scope**. Telehealth is appropriate for both management of illness and promotion of health and wellness.
7. **Holistic care**. Telehealth should be integrated into conventional clinical practice as part of a comprehensive approach to health care.
8. **Legacy integration**. Telehealth technology should be integrated with Kaiser Permanente's electronic health information systems.
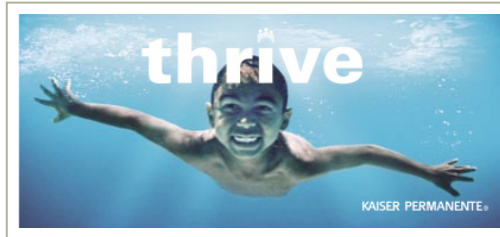
KAISER PERMANENTE®

Telehealth/Telemedicine @ Kaiser Permanente

- Recognized national leader in telehealth adoption/implementation

- All hospitals and most medical clinics, imaging labs built with telehealth/ telemedicine capabilities

- HealthConnect® EHR supports telemedicine applications

- In 2011, implemented over 50 telehealth/telemedicine projects that provided 250,000+ visits/encounters

- Focus in two areas: management of chronic illness and delivery of specialty services

 - Chronic patients → 5-10% of members → 60% of total costs

KAISER PERMANENTE®

A New Framework for Telehealth/Telemedicine

- Personalized, patient-centered, meaningful integrated approach to the utilization of information and communication technologies to support health and health care services

- Involves multiple types of technologies and different modes of communication and interaction

- Tailored to the patient, the environment, the condition

- Requires care redesign, pathway/workflow reengineering, patient education, training of clinicians/workforce and system interoperability

- Involves:

  - EHR, patient portal, low-level asynchronous communication, interactive teleconsultation (Patient-Provider and Provider-Provider), biometric monitoring, auto-upload, proactive communication

  - Support for wired, wireless, home-based, mobile platforms

KAISER PERMANENTE®

Opportunities and Challenges Ahead
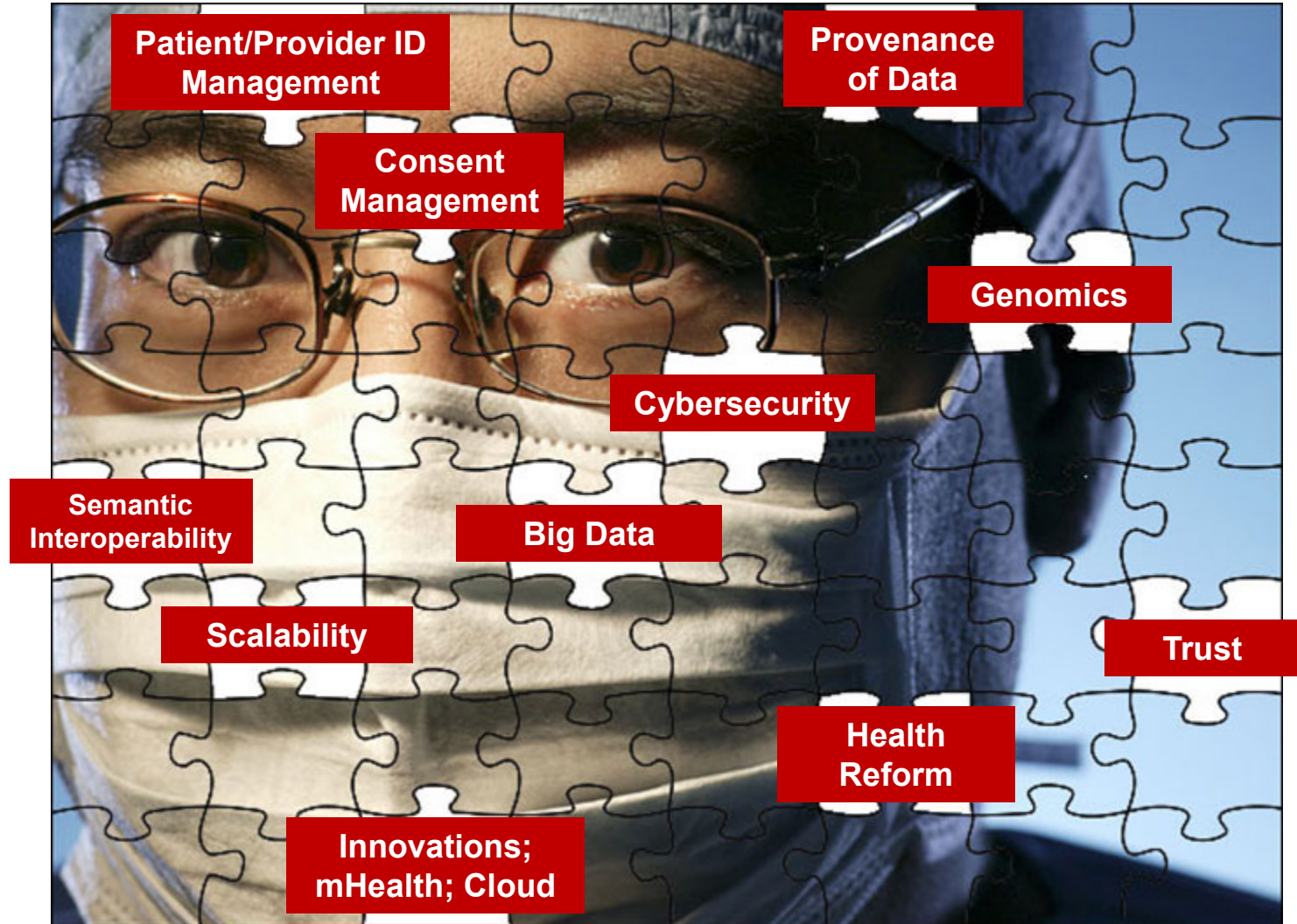
Thank You!

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