



Health IT at Kaiser Permanente: The Long and Winding Road to Transformation

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Agenda

- About Kaiser Permanente
- A Brief History of Health IT in Kaiser Permanente Before KP HealthConnect
- Lessons Learned
- KP HealthConnect Deployment
- Early Benefits

Our Structure

Kaiser Foundation Health Plans

Nonprofit, public-benefit corporations that contract with individuals and groups to arrange comprehensive medical and hospital services. Kaiser Foundation Health Plans contract with Kaiser Foundation Hospitals and medical groups to provide services.

Kaiser Foundation Hospitals

A nonprofit, public-benefit corporation that owns and operates community hospitals in California, Oregon, and Hawaii; owns outpatient facilities in several states; provides or arranges hospital services; and sponsors charitable, educational, and research activities.

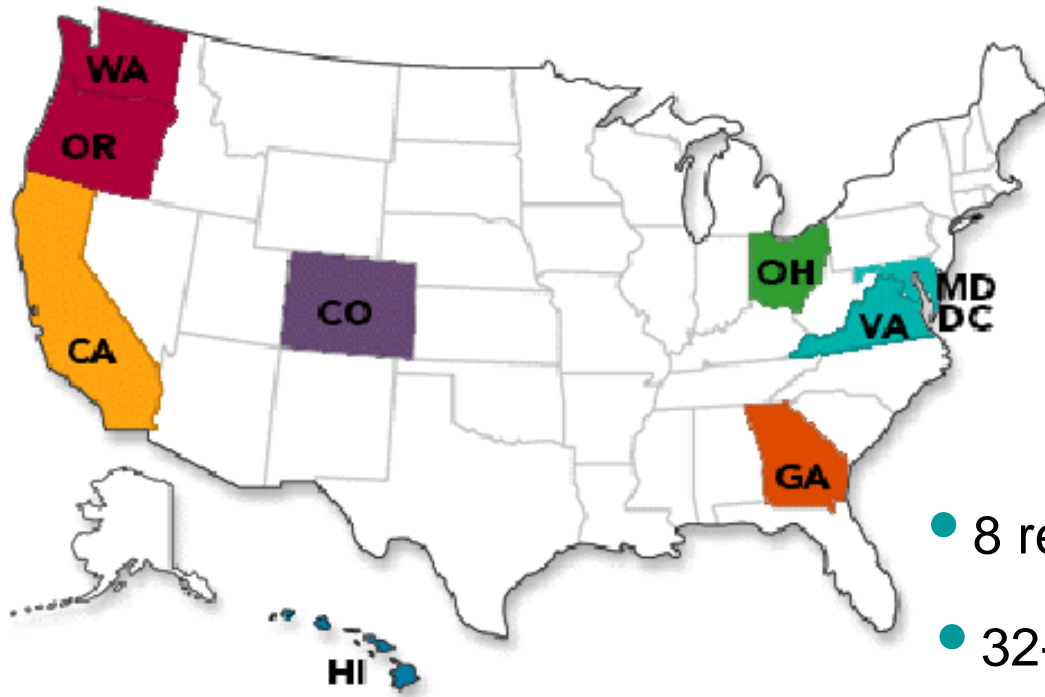
Permanente Medical Groups

Partnerships or professional corporations of physicians. Each region has its own Permanente Medical Group. The Permanente Medical Groups assume full responsibility for providing and arranging necessary medical care in each region.

Our Mission

To provide affordable, quality health care services and to improve the health of our members and the communities we serve.

About Kaiser Permanente



- Nation's largest nonprofit health plan
- Integrated health care delivery system
- 8.7 million members
- 13,000+ physicians
- 159,000+ employees
- 8 regions serving 9 states and D.C.
- 32+ hospitals and medical centers
- 435+ medical offices
- *\$37 billion annual revenues

* 2007 revenues

EHRs in Kaiser Permanente—the First Attempts

- 1970s: Morris Collen, MD pioneers the use of computers in recording and sorting clinical data in real time at the San Francisco Medical Center. The focus is physical examination and laboratory screening
- 1970-1980s: Regions independently automate demographic, appointments, pharmacy, laboratory and other ancillary systems
- Late 1980s: Regions experiment with clinical systems development and deployment without wide success
- Early 1990s: Several regions develop operations data stores, notably NCAL (CIPS), Ohio (MARS), and Mid-Atlantic (PACE) with various forms of real time data views and entry
- Mid-1990s: Northwest deploys EpicCare to all MDs and RNS, Colorado deploys CIS (joint development with IBM) to all MDs and RNs. These are the first two products not internally developed

Why did the 1970s Efforts Fail?

- Dr. Collen's work was fully supported by US Federal funding
- A new political party assumed power with the next Presidential election
- The President changed the strategic direction of NIH funding
- The project lost its support, and the work was discontinued

Lesson Learned—the Early Years

- Long term funding (at least 5 years, preferably 10) is essential for success
- Funding commitments cannot be subject to minor to moderate political pressure or change
- Funding commitments must transcend annual budget cycles while remaining aligned with financial realities
- A thorough business case must be prepared to address the concerns of those responsible for finances

Why did the 1980s Efforts Meet with Only Partial Success?

- Nine silos (8 regions + national)—resources were not leveraged
- No common platform
- Numerous disparate IT systems
- Limited standard data elements
- Expensive IT maintenance costs



Lesson Learned—the 1980s

- Autonomous development leads to competition for scarce resources
- Interfaces to legacy systems are more numerous, complex, and expensive than you think
- System maintenance is more expensive and complex, and it cannot be amortized across a larger base
- System evolution is difficult and expensive

EHRs in Kaiser Permanente—the National Projects

- 1997: A national clinical information system is established as a corporate goal of KP
- 1997-98: Distributed internal development with national integration
- As this project founders, a detailed reassessment produces:
- 1999-2002: Joint development with IBM and initial deployment
- 2002: Reassessment of strategy and shift to Epic Systems
 - Key questions:
 - Buy versus build
 - Suite versus best of breed
 - Single instance of entire program versus multiple instances to be synchronized
 - What are our clinical/operational goals
- 2003-present: KP HealthConnect

What Was Wrong with the Early National Projects?

- Deploying an EHR is a strategy, not a goal
- Distributed development with subsequent integration is achievable but very difficult and very expensive
- Interfaces to legacy systems are always more difficult than predicted
- We are a health care delivery system, not a software development firm

Lessons Learned from the Early National Projects

- It is possible and preferable to buy, not build
- A well-integrated system suite is preferable to integration of best of breed
- Clarity about operational goals must be achieved before beginning
- Engineering dogma is sometimes precisely that

Make vs. Buy Decision

- CIS strategy was risky and expensive
- Epic offered much broader integrated applications portfolio including outpatient, inpatient and practice management, web interface for members and providers, reporting capability
- Ten-year costs were substantially less than a build and maintain strategy
- Total involvement converted a push strategy to a pull strategy



Why We Chose Epic Systems

- Epic's solution ranked highest in our technology review.
- Epic had the best track record for implementation and partnering.
- Integration less complex because elements are already in use in certain regions within the Kaiser Permanente system.
- Epic eliminates redundant entry, thus eliminating more work steps, increasing operational efficiencies and improving customer service.
- Epic had the highest industry rankings for relationships and commitment.
- Epic was most closely aligned with Kaiser Permanente's program strategy.

The Business Case

- **Incorporate best analysis of total cost of ownership**
 - Licensing/maintenance
 - Equipment and network
 - Training, productivity losses, and change management
- **High risk, so high IRR/hurdle rate**
- **“Hard” benefits**
 - Reduction in system variation; system retirement
 - Decreased outpatient and ED visit rates
 - Reduction in pharmaceutical costs compared to expected
 - Decreased lab and imaging costs compared to expected
 - Reduced LOS
 - More efficient use of inpatient RN time
- **“Soft” benefits**
 - Improved quality and safety

Blue Sky Vision themes

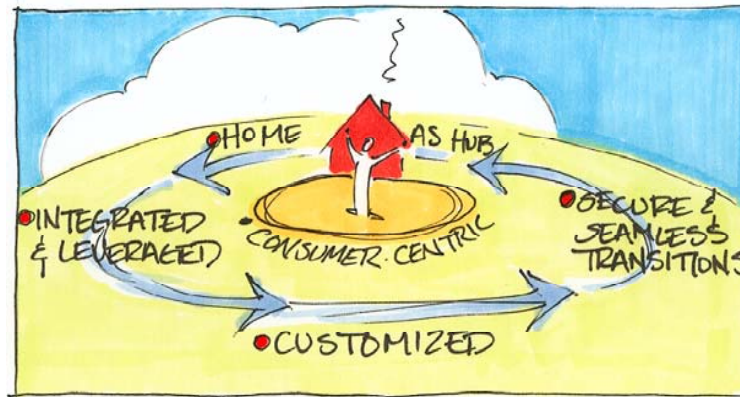
2015: care delivery model is consumer-centric

Home as the Hub

- The home, and other settings, will grow significantly as a locale of choice for some care delivery (diagnostics).
- An individual's care delivery support system has expanded to explicitly include other community and family resources

Integration and Leveraging

- Medical services are integrated with wellness activities; care delivery processes are integrated with health plan operations
- IT functionality enables us to leverage scarce or specialized clinical resources - MDs, RNs and other clinical staff.



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 (choosing health plans, cost sharing, individual care pathways, and communication modalities.)
- The member drives customization and KP responds.

Home as the hub

Self-monitoring with patient-based decision support

- They are already on their own most of the time

The care team

- Is notified of patient decisions
- Receives all data, but attention is only drawn to data requiring a decision from the team

The office visit no longer defines the core activity of the primary care physician, true panel management does

Systems will

- deliver and maintain the decision support tools for patients
- Sort through and prioritize incoming data
- Provide horizontal views of an individual patient and aggregate views of populations and subpopulations
- Allow for easy intervention at the population level

Secure and seamless transitions

The patient will not bear the responsibility for system navigation

- Some transitions will be automated based on evidence
 - Example: a patient drops below an LVEF threshold for the first time, automatically triggering a cardiology referral, any indicated further tests before the referral, and an email to the patient helping them to make the appointment unless the APC doc chooses to redirect

The care team will not have to remember the navigation rules

- This “business intelligence” will be built into the system

Customization

Patients will choose how they want to communicate with the care team and the system will know that

Information delivered to patients can be tailored to their problems and social history and circumstances

- An Enterprise Data Warehouse will help us craft a Life Care Plan for every member, based on everything we know (and some things other organizations know)
- The Life Care Plan will be actionable by the patient as well as the health care team

Mass communications to populations can be customized to each individual within the population

- Example: “.lastlab” within a letter

Pre-visit questionnaires can result in better focus during a visit

Integration and leveraging

Scarcer adult primary care physicians will be more leveraged

- More support staff doing more things for physician review
- NB: regulatory changes may be crucial here—the licensing world has to catch up with the capabilities of the new information world, and we should direct lobbying efforts toward that end
- Manage the panel, not results and messages layered on to a day filled with visits

Panel members are in control

Don't devote resources to being at war with members in "trenches"

The system will let them control the simple transactions

- Appointment making (just like the airlines)
- Lab and imaging results review
- Managing their illness according to guidelines
- Communicating with the team asynchronously—a huge potential time saver and satisfier for them and for the clinician

Take those resources not devoted to these functions and use them for communication management, panel management, and "outlier management"

Kaiser Permanente HealthConnect™

- More than just an electronic medical record
- The development and deployment of a highly-sophisticated information management and delivery system
- A program-wide system that will integrate the clinical record with appointments, registration and billing
- A complete health care business system that will enhance the quality of patient care

Kaiser Permanente HealthConnect™ Goals

Quality Our Patients Can Trust

High Quality

- We have clinical information available 24/7.
- Our clinical outcomes are unsurpassed.
- Our clinicians know in real-time the recommended best practices.
- We are the national leaders in patient safety.
- We enhance our research to support evidence-based care.

Personal & Convenient Service

Personal

- We have and use up-to-date clinical, social and patient preference information.
- We provide patients information for shared decision making.
- We enhance personalized care.

Convenient

- Our patients access information via telephone, Web and email.
- We actively support our patients' participation in their own care.
- We minimize wait times and out-of-pocket costs with efficient access to care.
- We achieve superior integration and continuity of care.

Affordable Health Care

Affordable

- We reduce the cost of care and improve visit experiences.
- We eliminate waste associated with paper medical records and missing medical records.
- We eliminate costly in-person services unless medically necessary or desired by the patient.
- We streamline IT and administrative processes and costs

Health data standards

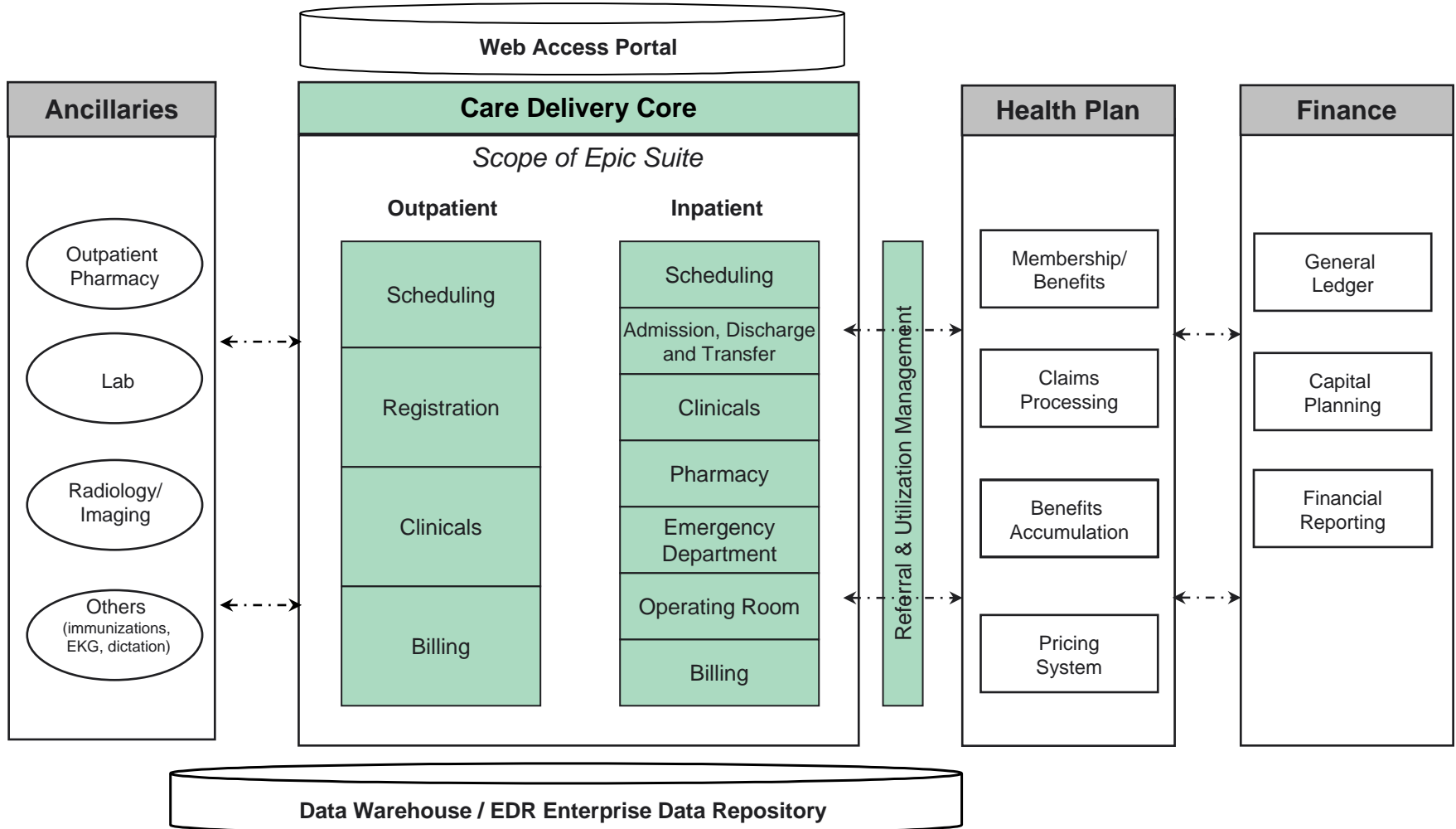
KP HealthConnect meets national and international standards for the transmittal and storage of health data:

- HL7
- SNOMED-CT
- LOINC
- RXNORM
- NIC
- NOC
- NANDA
- DICOM, etc.

Lessons learned

- Consistency and local modification need to be balanced
- Centralized control vs. local autonomy
- IT is the “great magnifier”
- Integration into the basic work is critical
- IT system drives massive change
- Operational leadership is essential

Scope of Kaiser Permanente HealthConnect™



KP HealthConnect regional deployment status

As of 3.23.07

	Ambulatory Clinicals (EMR, decision support tools)	Ambulatory Practice Mgmt (scheduling, registration, billing)	Inpatient Clinicals (EMR, ED, OR, decision support)	Inpatient Practice Mgmt (hospital billing, ADT, chart tracking)
CO	✓	✓	Complete in one partner hospital	Complete one partner hospital
GA	✓	✓		
HI	✓	✓	2009	✓
OH	✓	✓		
MAS	✓	✓		
NW	✓	✓	10/2008	✓
NCAL	✓	✓	8 sites live (complete Q1 2010)	✓
SCAL	✓	✓ (except scheduling w/chart pull)	✓	✓

KEY

- Launched
- Scheduled for Launch
- No Launch Date Identified

My Health Manager Launches

	CO Denver/Boulder	GA	HI	MAS	NCAL	NW	OH	SCAL
	My Health Record							
My test results	✓	✓	✓	✓	✓	✓	✓	✓
My allergies	✓	✓	✓	✓	✓	✓	✓	✓
My immunizations	✓	6/10/08	✓	✓	✓	✓	✓	✓
Past visit information	✓	✓	✓	✓	✓	✓	✓	✓
My ongoing health conditions	✓	✓	✓	✓		✓	✓	
Total Health Assessment (THA) ¹	6/19/08	4/30/08	4/1/08	✓	8/20/08	5/19/08	4/11/08	3/27/08
My Prescriptions	✓	6/10/08	✓	✓	Limited 3 August-08	✓	✓	
Rx Refill	✓	✓	✓	✓	✓	✓	✓	✓
Contact a pharmacist	✓	✓	✓	✓	✓	✓	✓	✓
Email My doctor	✓	✓	✓	✓	✓	✓	✓	✓
Request update to med record	✓	✓	✓	✓		✓	✓	✓
My healthcare reminders	✓	✓	✓	✓	Tech 2	✓		✓
Direct Access for Teens over 12/13 yrs	✓		✓	✓		✓	✓	
Adult-Child Act for family member	✓	✓	✓	✓	✓	✓	✓	✓
Adult for Teen (requires regional resource for setup)	✓		✓			Pilot	✓	
Adult-Adult Act for a family member	12/10/08		7/30/2008	7/30/2008	✓			3/27/08

My Health Manager Launches continued

	CO Denver/Boulder	GA	HI	MAS	NCAL	NW	OH	SCAL		
My future appts	✓	✓	✓	✓	✓ ⁴	✓	✓	✓		
Request an appointment	✓	✓	✓	✓	✓	✓	✓	✓		
Schedule appts	12/10/08	✓ 8/13/08	Tech 2 Sept-08	✓	✓ ⁴		10/15/08	11/12/08		
Cancel appt	✓	✓	✓	✓	✓ ⁴	✓	✓	11/12/08		
My eligibility & benefits	12/10/08	✓ 9/16/08		✓	✓		10/15/2008	✓		
Flowsheets	Tech 2	✓ 9/10/08	✓	✓	Limited 3 2/23/08			✓		
Alerts (Patient)	12/10/08		✓	✓	✓	4/21/08	4/4/08	✓		
My health summary	12/10/08		✓ 7/30/2008	✓	10/15/08		5/28/2008	✓		
My referrals	12/10/08	11/12/08		✓ 7/30/2008						
My wallet card	12/10/08		✓ 7/30/2008	✓ 7/30/2008						
Affiliate link (for Affiliate Providers)	✓	✓		✓			Tech 2 10/8/08	Tech 2 10/23/08		
In Development										
My claims		11/12/08								

The Sorcerer's Apprentice

“The dream of a comprehensive, universally accessible EPR has not yet been realised on any significant scale anywhere in the world. ”

--Professor Tricia Greenhalgh,

University College London –May 2008

As we would say in the US—“Baloney!!”

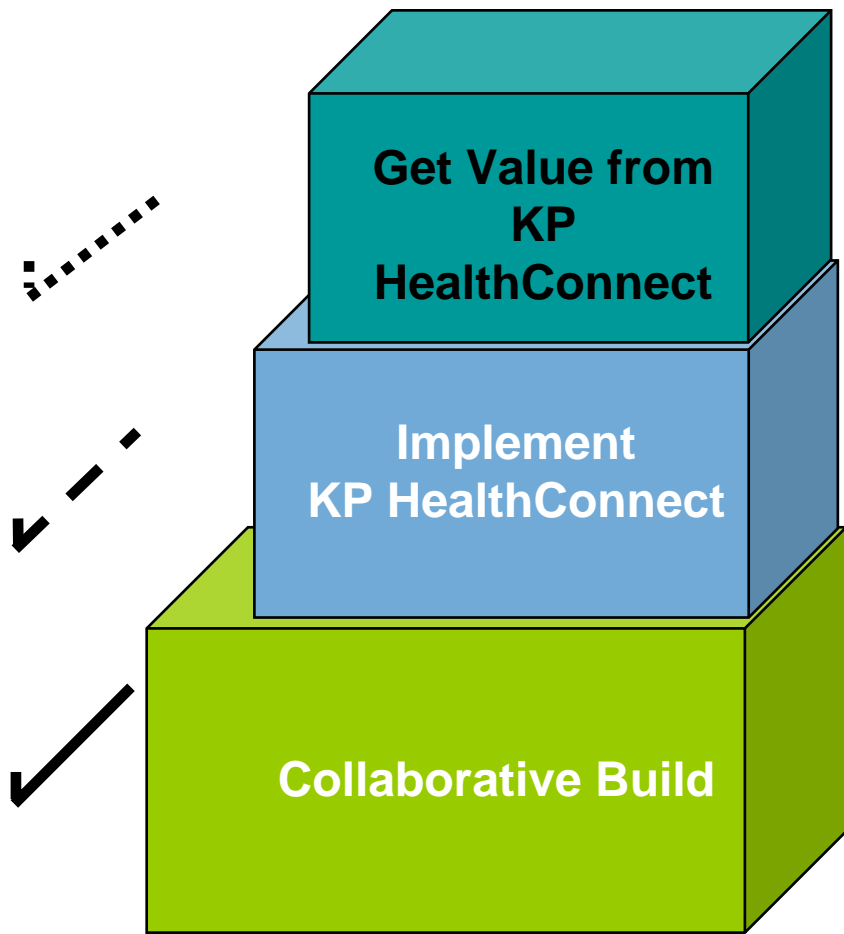
PHR Statistics

- Available to all 8.6 million members, including proxy access
- More than 2.3 million active users, with $\geq 80,000$ more enrolling monthly
- More than 500,000 secure messages exchanged with practitioners each month
- More than 50 million lab results released on line with more than 20 million reviewed by members

Benefits realized to date

- **Increasingly rational legacy systems environment**
 - Retirement of multiple legacy systems=\$ millions in savings with much more to come
- **24/7/365 access to health information**
 - 11% decrease overall in face-to-face visits
- **7-10% primary care visit reduction in members using secure messaging**
- **Reduction in ancillary utilization**
 - Presumed drop in redundant testing and imaging
- **Dramatic satisfaction increases with the use of the After Visit Summary**
- **Tantalizing:**
 - Reduction in progression of diabetic nephropathy
 - Improved pharmacologic intervention in coronary disease (aspirin-lovastatin-lisinopril=ALL)
 - Dramatic (75-90%) reductions in post-AMI mortality
 - Standardization of care—orthopedics, anesthesia, obstetrics, oncology, inpatient nursing care planning
 - “Longitudinal care” is increasing
 - Reduced phone and letter traffic related to results notification

Challenges



Formidable

Leadership &
Regions' Responsibility

Demanding

*Regions' Responsibility
with help from National
Project Team*

Difficult

*Vendor / Project Team/
Regions Responsibility*

Success is...

- A clear plan for change and operationalized use of the Epic system.
 - Business goals enabled by the Epic system
 - Higher quality, more efficient, effective operations
 - Sponsorship / leadership
-
- Effectively trained users
 - Consistent and complete system use
 - Ease of use
-
- Program-wide system
 - Reliable, consistent and maintainable
 - Robust functionality

Improving Current Workflows

- Nurse Knowledge Exchange
- Chemotherapy infusion management
- Documentation of routine ambulatory care
- Inpatient documentation using flowsheets
- Medication reconciliation between levels of care

Changing Current Workflows

- Streamlining the refill process
- Clinical information present and used at all points of contact
 - Pharmacy
 - Lab
 - Imaging
 - Telephone advice
 - ED

Transformation to New Workflows

- Bar coding for medication administration
- On-line communication and appointment making
- Population management via non-physician teams
- Simultaneous primary care and specialty care “visit”
- Use of kiosks for registration and preliminary history-taking and screening

Fostering Innovation

- Build a sandbox
- Establish ground rules for use
- Provide seed funding
- Let people play, evaluate, and allow them to fail
- Dissemination of successful innovation is the hardest step of all

Top Ten Reasons You Should Listen to Me

- I seem like a nice man
- I have an honest face
- I am 6'6"
- I have come all this way just to talk to you
- I use all the right jargon
- My mother thinks I am smart
- I am a pediatrician, so I know what to do when doctors behave like children
- Kaiser Permanente's annual budget exceeds the GDP of several countries
- Kaiser Permanente's delivery system looks right to you
- Or...

The Answer

- I have been a witness to or a party to all the serious mistakes that can be made when developing or deploying an EHR, and I have survived to tell you about them.
- “The Americans can always be relied upon to do the right thing...
- ...after they have exhausted all of the other possibilities.”

Winston Churchill

Top Ten Reasons You Should Listen to Me

- I seem like a nice man
- I have an honest face
- I am 2 meters tall
- I have crossed 7 time zones, 1 day, and an ocean (metaphorically), just to talk to you
- I use all the right jargon
- My mother thinks I am smart
- I am a pediatrician, so I know what to do when doctors behave like children
- Kaiser Permanente's annual budget exceeds the GDP of several countries
- Kaiser Permanente's delivery system looks a lot like yours
- Or...

The Answer

- I have been a witness to or a party to all the serious mistakes that can be made when developing or deploying an EHR, and I have survived to tell you about them.

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