Health Information Technologies – A New Blueprint for Systems Improvement

ABSTRACT----------

Translating Advances in Health Information Technologies into Improved Care for Populations, Patients and Families

In this session presenters will share their experience in fields ranging from personal health records, biosurveillence, disease management, hospital quality data, genomics and data supporting quality improvement. The aim of the session will be to consider the contribution that such developments are making to enhancing care for individuals, families and populations.

BIOGRAPHY----------

David W. Bates, MD, MSC
Professor of Medicine, Harvard Medical School

Professor of Health Policy and Management
Harvard School of Public Health

Chief, Division of General Internal Medicine
Brigham and Women's Hospital

Dr. Bates is an internationally renowned expert in using information technology to improve clinical decision-making, patient safety, quality-of-care, cost-effectiveness, and outcomes assessment in medical practice. A practicing general internist, Dr. Bates is Chief of the Division of General Internal Medicine at Brigham and Women's Hospital in Boston, a Professor of Medicine at Harvard Medical School, and a Professor of Health Policy and Management at the Harvard School of Public Health, where he co-directs the Program in Clinical Effectiveness. He also serves as Medical Director of Clinical and Quality Analysis for Partner's Healthcare Systems.

At a time when patient safety has become a key driver for focusing national attention on health-care quality, Dr. Bates' work has not only shown the magnitude of the problem but also provided a blueprint for helping solve it. He led a seminal study on the epidemiology of drug-related injuries, demonstrating that the most effective way to prevent serious medication errors is to focus on improving the systems. He has also performed many studies on how computerized, evidence-based guidelines can improve quality and efficiency. Dr. Bates has been recognized for several years by Modern Healthcare magazine as one of the "100 most powerful" individuals in U.S. health care.

Dr. Bates is a graduate of Stanford University, and the Johns Hopkins School of Medicine. He began his fellowship in general internal medicine at Brigham and Women's Hospital in 1988, and he received an M.Sc. in Health Policy and Management from the Harvard School of Public Health in 1990. He has been elected to the Institute of Medicine, the American Society for Clinical Investigation, the Association of American Physicians and the American College of

Medical Informatics, and is chairman of the Board of the American Medical Informatics Association. He serves as external program lead for research in the World Health Organization's Global Alliance for Patient Safety. He is the Editor of the Journal of Clinical Outcomes Management, and the Associate Editor of the Journal of Patient Safety.

Dr. Bates' special research interests include clinical decision-making and affecting physician-decision-making, particularly using computerized interventions; quality of care and cost-effectiveness and medical practice; and outcome assessment. He has published on medication errors and injuries due to drugs, and the use of information systems to improve medication safety and the use of ancillary tests, as well as on predictors of bacteremia and evaluation of patients with suspected sepsis. He has over 400 peer-reviewed publications.

Donald Goldmann, MD
Senior Vice President
Institute for Healthcare Improvement (IHI)

Professor of Pediatrics
Harvard Medical School

Professor of Immunology and Infectious Diseases
Harvard School of Public Health.

Donald Goldmann, MD, Senior Vice President, Institute for Healthcare Improvement (IHI), is responsible for fellowship training, faculty relations, the innovation pipeline, publications, and knowledge management. He is also the principal IHI liaison to a number of strategic allies, including the Joint Commission, CMS, AMA, CDC, and AHRQ. Dr. Goldmann's career in clinical infectious diseases and epidemiology (with a focus on hospital-acquired infections) spans more than three decades. He remains on the infectious diseases clinical staff at Children's Hospital Boston, and he is Professor of Pediatrics at Harvard Medical School and Professor of Immunology and Infectious Diseases at the Harvard School of Public Health.

Leveraging HIT to Improve Healthcare Delivery Systems

Don Goldmann, M.D.
Senior Vice President
Institute for Healthcare Improvement
Professor of Pediatrics
Harvard Medical School

Roadmap

- Brief orientation to IHI
- Improvement essentials
  - Planned care model
- Keys to adopting improvement-oriented HIT applications in ambulatory settings
- Examples
  - Kaiser Permanente
  - Indian Health Service

IHI Staff

IHI Blueprint: IOM's Six Aims

- *Safe* – no needless deaths
- *Effective* – no needless pain or suffering
- *Patient-Centered* – no helplessness in those served or serving
- *Timely* – no unwanted waiting
- *Efficient* – no waste
- *Equitable* – for all

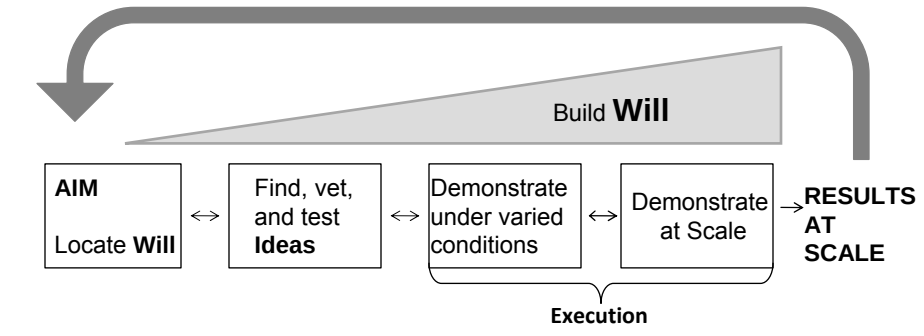
What's Needed to Improve

- Will
- Ideas
- Execution

Where do the ideas come from?

How do we increase
our degree of belief that the ideas
are valid?

IHI's "Production" Model

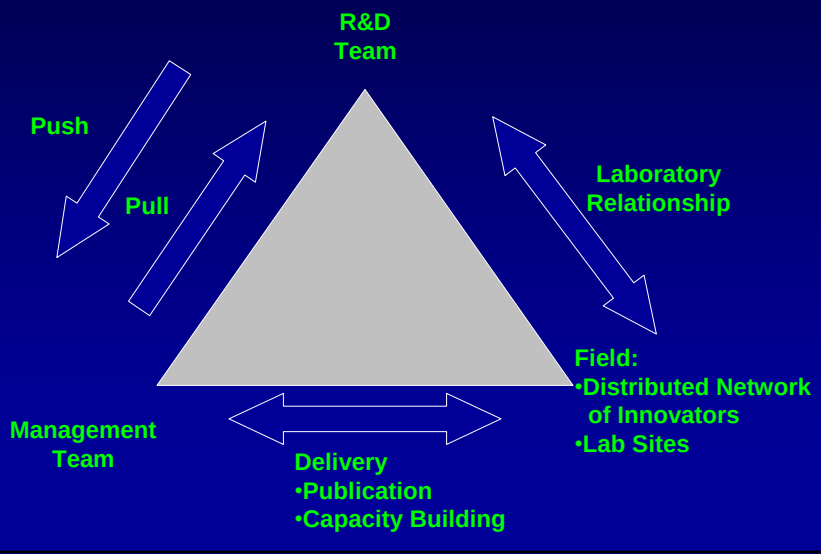


Institute for Healthcare Improvement

Four Phases of Innovation

1. R&D
2. Prototyping
3. Pilot Testing
4. Spread and Dissemination

R&D Team Linkages



R&D in 90 Days

- Dynamic process: Constant scan, prioritized by Management Team and R&D team
- Scan the environment for innovative ideas in healthcare and beyond
- Prioritize topics (Management Team and R&D team)
- For clinical issues, develop a "conceptual model" and key "drivers" for ideal care, corresponding hypotheses to be tested, and a packages of promising change concepts
- Develop a "technical brief" and "technical specifications" for further work
- Make "go" or "no go" decision regarding further development
- Develop a learning and testing/prototyping plan

The Future of R&D?

- Distributed learning and innovation
  - P&G model (Tide To Go)
    - Metric: % of new products "not invented here"
  - Wiki, blogs, other social networking tools…….

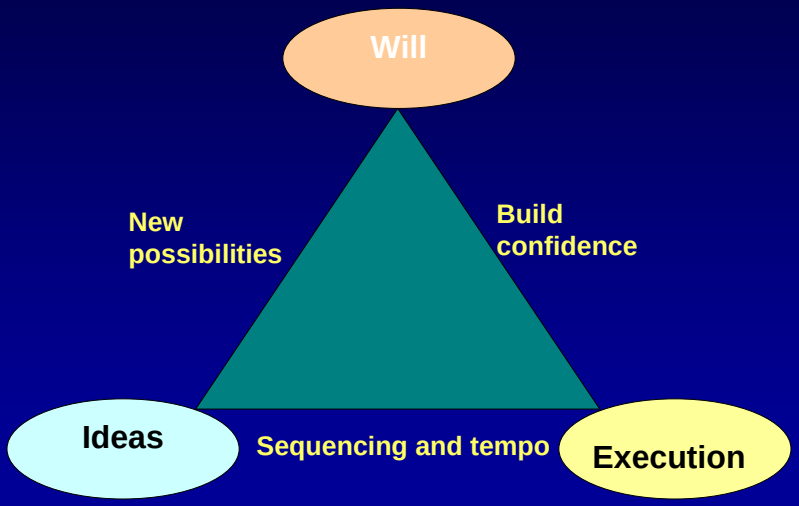
Phases of Innovation

- Prototype Testing
  - Specify aggressive goals and high-level measures ("raise-the-bar targets")
  - Intensively evaluate the validity and feasibility of the conceptual model, drivers, change package, and targets
    - Determine if even 1 or 2 highly committed organizations can achieve the targets
    - Determine whether to proceed with pilot testing, abandon the idea, or revisit R&D

Phases of Innovation

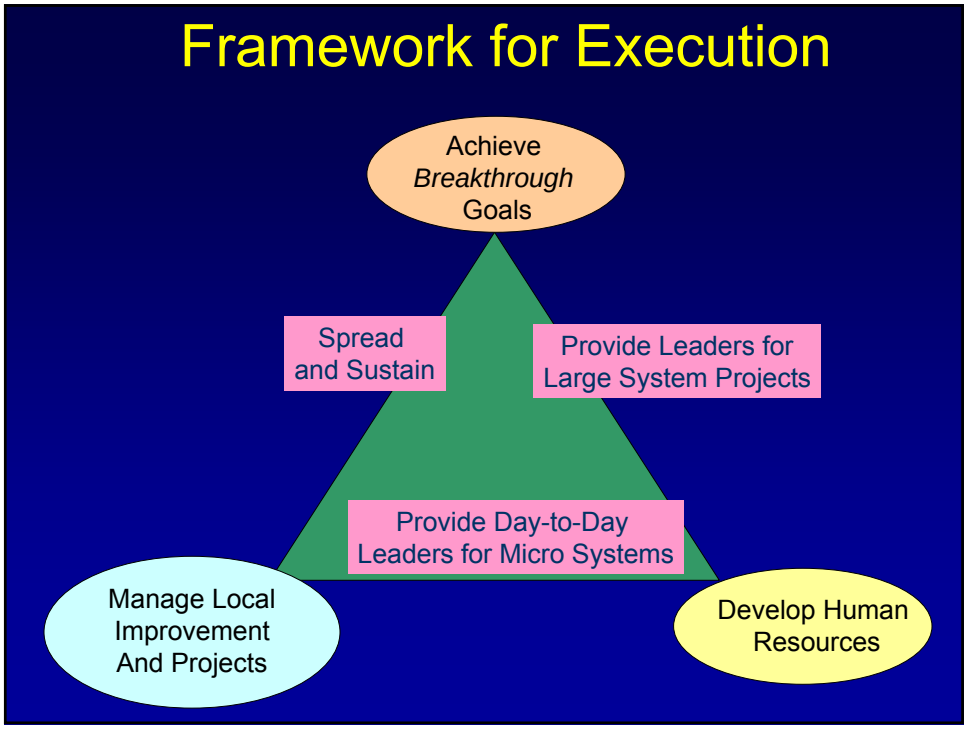
- Pilot Testing
  - Expand testing to increase degree of belief that the changes will result in improvement under a broader range of organizations and conditions
    - Collaboratives, increasingly virtual
- Spread and Dissemination
  - Scale up regionally and nationally
    - 100,000 and 5 Million Lives Campaigns
    - Durable network of "nodes" and "mentor hospitals"

Achieving System Level Results



Assessing Will (to Make the Changes)

- What are we trying to accomplish?
- What investments are we willing to make?
- What activities should we de-emphasize?
- What conflicts are we willing to resolve?
- What risks are we willing to take?
- How much disruption in the organization are we willing to support to make the transition to a better performing system?



IHI's Increasing Focus on IT as a Critical Element of System Improvement

Board Subcommittee
IT Work Group

IHI Board Subcommittee IT Workgroup

The Work Group will consider current and future developments in information (IT) within and outside of healthcare….

…. to inform IHI's current and future strategic and operational activities.

IT Work Group Work Plan Dec 2008

Methodology

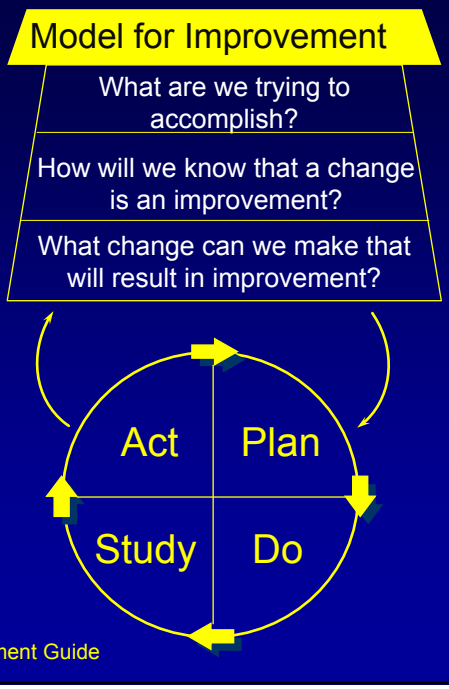
- Qualitative, modified Delphi approach
- Semi-structured key informant interviews
- Site visits
- Expert panel


Interviews (30 +)
New England Healthcare Institute
PARTNERS HEALTHCARE
map of medicine
Zynx Health
PeaceHealth
Microsoft Health
GE Global Research
DukeMedicine
INSTITUTE FOR HEALTHCARE IMPROVEMENT
AHRQ
Beth Israel Deaconess Medical Center
GENERAL DYNAMICS
Strength On Your Side
ASCENSION HEALTH
sas
AMIA American Medical Informatics Association
navesink consulting group
Epic
KAISER PERMANENTE
MASSACHUSETTS GENERAL HOSPITAL
TAKE CARE NEW YORK
BRAIN
Intermountain Healthcare
NewYork-Presbyterian The University Hospital of Columbia and Cornell
BlueCross BlueShield Association
MAYO CLINIC
HIMSS
PREMIER
HHS.gov Health Information Technology
MAEHC Massachusetts eHealth Collaborative
Walmart Save money. Live better.
United States Department of Veterans Affairs

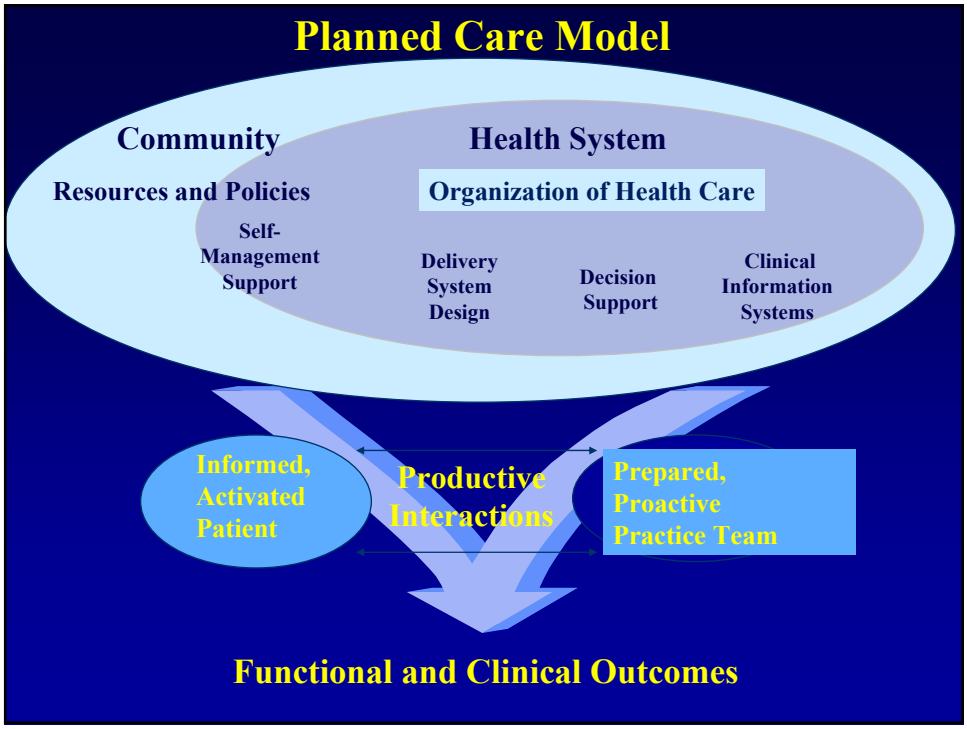

Site visits (14)
KAISER PERMANENTE
NC STATE UNIVERSITY
Textiles
massachusetts institute of technology
NewYork-Presbyterian The University Hospital of Columbia and Cornell
Epic
Beth Israel Deaconess Medical Center
PARTNERS HEALTHCARE
*
MAYO CLINIC
DukeMedicine
sas
*
eClinicalWorks
Intermountain Healthcare
*
TAKE CARE NEW YORK
United States Department of Veterans Affairs

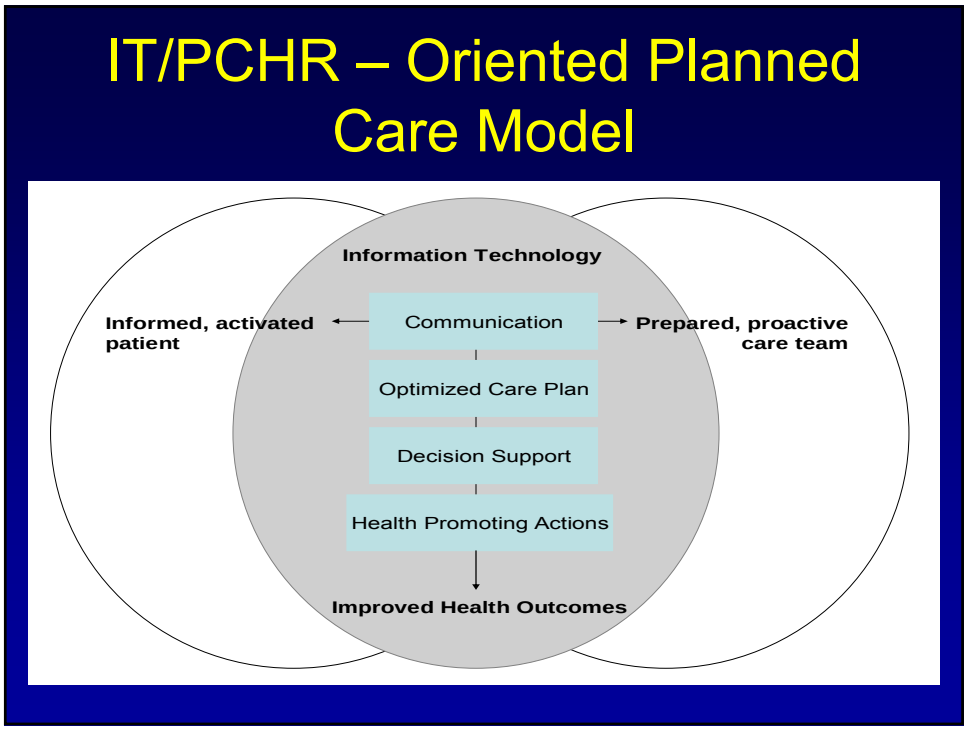
Results

- Bottom line – IHI has an important role to play in:
  - Translating advances in HIT into improved patient care
  - Helping providers improve clinical delivery systems to take maximum advantage of advances in HIT
  - Fostering iterative, rapid cycle improvement in HIT applications by bringing the voice of providers and patients to software developers
- Patient-centred HIT increasing importance



Source: The Improvement Guide


Planned Care Model
Community
Health System
Resources and Policies
Organization of Health Care
Self-Management Support
Delivery System Design
Decision Support
Clinical Information Systems
Informed, Activated Patient
Productive Interactions
Prepared, Proactive Practice Team
Functional and Clinical Outcomes


IT/PCHR – Oriented Planned Care Model
Information Technology
Informed, activated patient
Communication
Prepared, proactive care team
Optimized Care Plan
Decision Support
Health Promoting Actions
Improved Health Outcomes

EHR Adoption In US Office Practice Settings

- 4% fully functional system
- 13% partially functional system
- Users tended to be in hospital or large practice settings, and in the West
- Among users
  - High satisfaction
  - User reported increased quality of care
- Financial barriers to implementation
  - Seeds of the ARA strategy

DesRoches, et al., NEJM 2008;359:50

Key Levers for Implementing EHR

- Provide immediate, practical benefit to caregivers
  - Camp and school physicals
  - Billing in a complex payer environment
  - Meet P4P and value added purchasing reporting requirements and Physician Quality Reporting Initiative (PQRI)

Key Levers for Implementing EHR

- Provide vendor and "extension service" support to match:
  - EHR systems and functionality
  - Work systems that support improvement
    - KP/EPIC panel management functionality
  - Virtual collaborative support networks for small and rural primary care practices
- Create a culture in which the care team does not fear retribution but celebrates failure as learning opportunities
  - Requires rapid cycle learning capability and response IT vendors

Key Levers for Implementing EHR

- Create a "business case" for implementation
  - Not a case for cost-effectiveness in which the financial benefits flow to payers, or even society at-large
  - Rather, a business case to justify the investment needed to install, implement, train, and sustain
- Increase joy in work for physicians and the care team (decrease the current level of desperation, especially for physicians in primary care)
  - All care team members working to skill limit
  - Visit prep offloaded from MD to care team
    - Goals, gaps and data ready on-demand
  - Reduce unnecessary visits, increase virtual visits and asynchronous communication to manage workload

Key Levers for Implementing EHR

- Tap providers' innate desire to improve care
  - Provide panel views and dashboards
  - Provide *appropriate* alerts and reminders
    - Unintended consequences (examples)
      - Alerts turned off
      - Pharmacy staff overwhelmed
      - Established shortcuts undermined in ICU care

Key Levers for Implementing EHR

- Fully embrace patient and family centered care
  - Place the patient and family at the center of systems improvement, including EHR implementation
    - Include patients and families on the planning team
  - Make the "Home the Hub" (Kaiser Permanente)
    - "I get precisely the information I want and need precisely when, where, and in the form I want and need it" (after J Wasson)
  - Link the EHR to a fully function PCHR
    - Consider which has primacy
  - Can direct consumer engagement (a "movement") carry the day?

Key Levers for Implementing EHR

- Make PCHR, electronic messaging and tele-monitoring central to improving continuity of care
  - True patient, family and carer-centeredness
  - Focus on chronic disease management and prevention
    - Fully leveraged non-MD (even non-nurse) resources, including full spectrum of community services
    - Outcome measures: reduced ED and hospital visits, specialty care encounters
    - Home monitoring and early "triggers" of deterioration
  - Use PCHR's full capability
    - Med lists/reconciliation based on what the patient is actually taking
    - Push-pull of public health and wellness information, adverse drug effects
    - Health status measurement

Patient Centered Medical Home

- Regular doctor or place of care for every patient
- Physician-directed medical practice
  - Multi-disciplinary team
- Whole person orientation
  - Acute, chronic, preventive, end-of-life care
- Care coordinated/integrated across whole system
- IOM quality dimensions
- Enhanced access
  - Open access scheduling, expanded office hours
- Payment recognizes the added value and multi-disciplinary approach

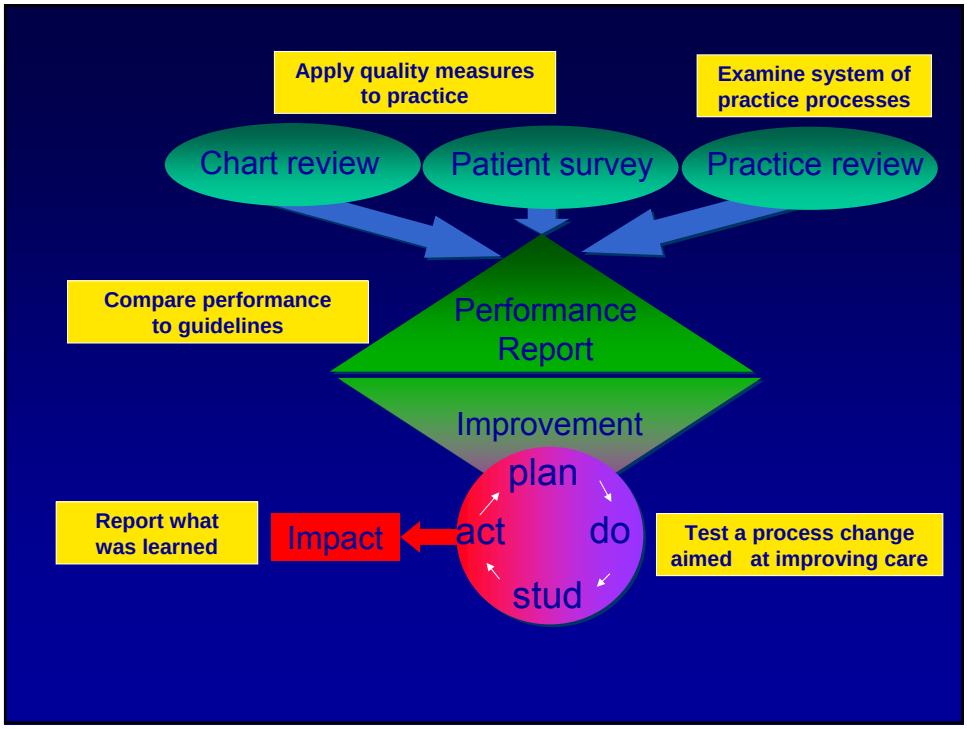
This is NOT a *Physician–Centered* Medical Home
But it IS a synopsis of the *Planned Care Model*

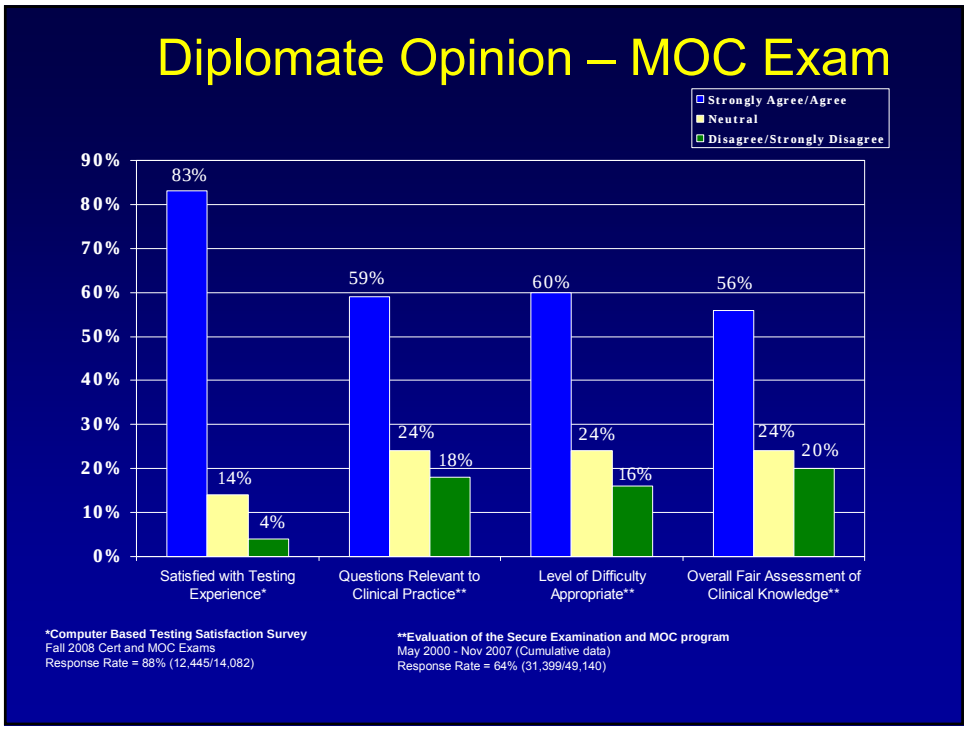
Leveraging Physicians in the Planned Care and Medical Home Models

- Create and embrace a system where each individual works up to highest possible skill level
  - Match skills to difficulty of the medical problem
- Care coordination and management
  - Chad Boult: nurse-directed Guided Care
  - Bruce Leff: Home Hospital
  - Eric Coleman, Geriatric Interdisciplinary Care
  - Mary Naylor: Transitional Care for Elders (AP Nurses)
- Non-MD procedures (e.g., colonoscopy)
- Nursing doctorates in clinical care

Key Levers for Implementing EHR

- Enable maintenance of certification
  - ABIM Performance Improvement Modules (PIMs)
    - Web-based practice self-evaluation using NQF/AQA measures when available (e.g., diabetes core measures)
    - Practice improvement (PDSA) required to address areas identified as needing improvement
    - Includes patient experience, practice infrastructure, patient surveys
  - New ABMS requirements
  - Legislative mandates to imbed in Physician Quality Reporting Initiative (PQRI)
    - http://www.cms.hhs.gov/PQRI/01_Overview.asp


Apply quality measures to practice
Examine system of practice processes
Chart review
Patient survey
Practice review
Compare performance to guidelines
Performance Report
Improvement
plan
do
stud
act
Report what was learned
Impact
Test a process change aimed at improving care


Diplomate Opinion – MOC Exam
Strongly Agree/Agree
Neutral
Disagree/Strongly Disagree
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83%
14%
4%
59%
24%
18%
60%
24%
16%
56%
24%
20%
Satisfied with Testing Experience*
Questions Relevant to Clinical Practice**
Level of Difficulty Appropriate**
Overall Fair Assessment of Clinical Knowledge**
*Computer Based Testing Satisfaction Survey
Fall 2008 Cert and MOC Exams
Response Rate = 88% (12,445/14,082)
**Evaluation of the Secure Examination and MOC program
May 2000 - Nov 2007 (Cumulative data)
Response Rate = 64% (31,399/49,140)

Early PIM Adopters

- A significant majority found the experience valuable
  - All performed chart audit themselves
  - Many identified unrecognized deficiencies
  - Audit and patient survey most valuable
- PIM Survey (January 2008)
  - 72% changed their practice as a result of completing the module (n=1801)
  - 82% would recommend the PIM to a colleague (n=1213)
- Since the assessment requirement went into effect in 2006, 16,759 PIMs have been completed

PIMs: Significant MD Improvement

Review of Hypertension PIM re-measurement results for general internists (115) and subspecialists (53)

Target Measure Category		
(Mean re-measurement N=31 patients)	Number of physicians	Mean Δ
Blood Pressure or Lipid Control	52	+ 28%
Medication Selection/Adherence	12	+ 33%
Non-pharmacological Treatment/Self-care Support	69	+ 50%
Patient Evaluation & Testing	35	+ 37%

A Future Based on Real-time Analysis of Rich, Interoperable Clinical Databases

- Comparative Effectiveness Research Now
  - Largely based on expensive, time-consuming systematic reviews or meta-analyses of randomized trials (and sometimes observational studies)
    - Information out-of-date by the time it is analyzed
    - Data that is difficult to generalize across populations, geographical areas, and contexts

A Future Based on Real-time Analysis of Rich, Interoperable Clinical Databases

- Future comparative effectiveness research
  - Real-time analysis of large observational datasets
    - "Phase 4" data and alerts
      - Drug alerts (VIOXX)
      - Public Health alerts and trends
      - Quality Improvement, policy effectiveness
  - Dynamic comparative effectiveness research
    - Context-sensitive, based on community-based participatory research
      - Meta-analytic design
    - Provider and patient-relavent, based on pragmatic research
    - Adaptive, based on quality improvement model

21st Century Care Innovation Project : Aims

What is the 21st Century Care Innovation Project Doing?

- Changing our paradigm of primary care delivery from encounter based (provider office visit) to longitudinal relationship-based
- Moving away from how many patients can you see in a day to how do I manage the total health of my panel every day over the course of their membership with KP

Why now? We now have the tools through HealthConnect (initiated in 2004) to make this shift patient-centered and efficient/effective for our clinicians and staff (KPHC and KP Online)

How? A multi-site prototyping collaborative featuring:

- Collaborative learning based on the Model for Improvement
- Close collaboration with IT and vendor (EPIC)

41

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21st Century Care Innovation Project: Conceptual Model

The conceptual model based on the KP Promise to members and Blue Sky Vision of:

- Transforming the system to be patient-centered
- Caring for the member as a total being – caring for the whole person not just a disease or condition
- Empowering members to be more proactive and engaged in their care
- A delivery process where all members of the care team can participate in supporting the member's care – because information is available to all members of the team all the time
- Ensuring that the work environment is sustainable and healthy for our physicians and staff
- Integrating and leveraging technology to improve care delivery
- Doing things right the first time so that we eliminate waste in the system

42

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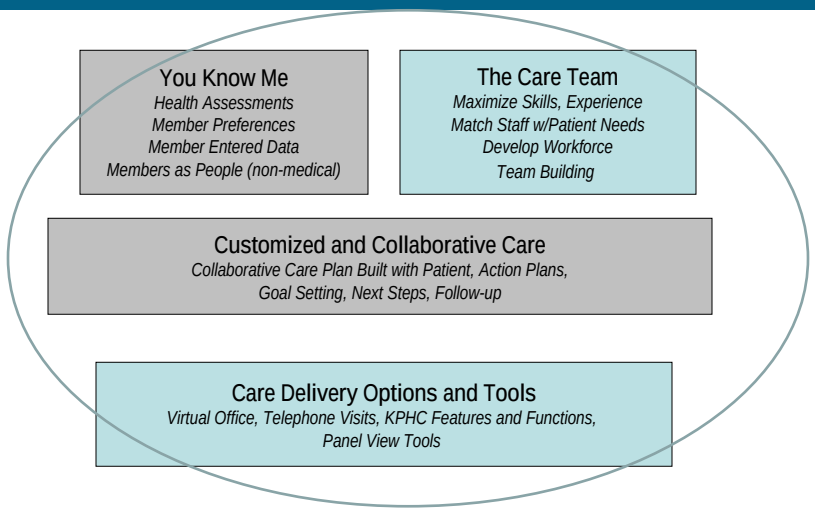
21st Century Care Innovation Project: Concept Design



43

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21st Century Care Innovation Project: Results (Hawaii Region)

Health Connect Implementation (completion dates):

- November 2004: Primary care
- June 2005: Specialty care
- September 2005: Patient-provider secure messaging

Chen, et al., Health Affairs 2009;28:323

44

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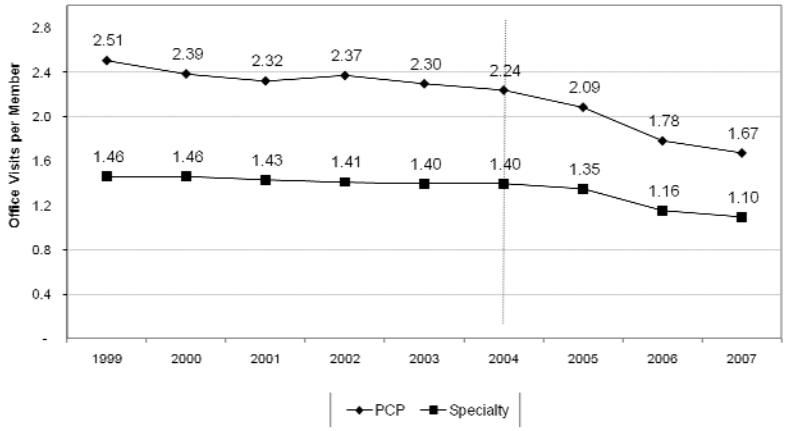
Change in Office Visit Rates, KP Hawaii Members



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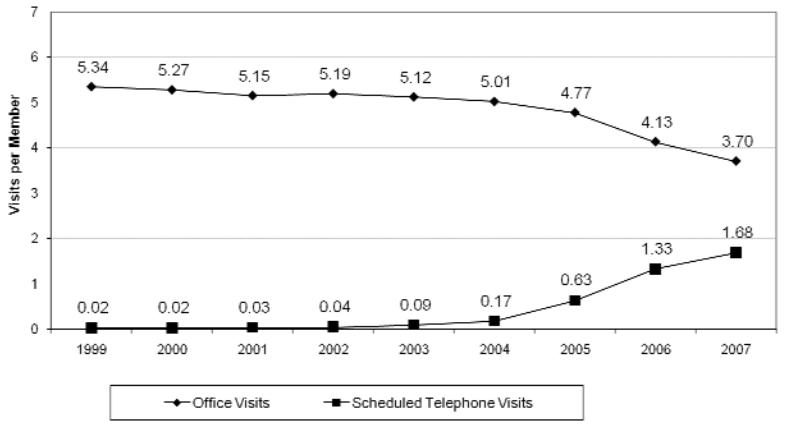
Change in Office Visits versus Telephone Visit Rates



46

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HEDIS Measures, 2004-07

- Improvement in 16 measures
- Deterioration in 5 measures
- No change in 1 measure

47

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Indian Health Service

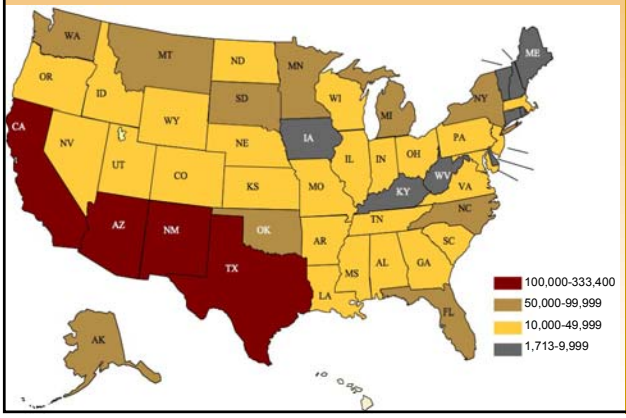
Mission and Goal

Mission: To raise the physical, mental, social, and spiritual health of American Indians and Alaska natives to the highest level.

Goal: To assure that comprehensive, culturally acceptable personal and public health services are available and accessible to American Indian and Alaska Native people.

IHS provides comprehensive health service for:

1.9 Million American Indian/Alaska Natives
562 Federally Recognized Tribes
36 States



IHS

31 Hospitals
50 Health Centers
2 School Health Centers
31 Health Stations

Tribal

15 Hospitals
254 Health Centers
18 School Health Centers
112 Health Stations
166 Alaska Village Clinics

Urban

34 Urban Indian Health Programs

RPMS Framework

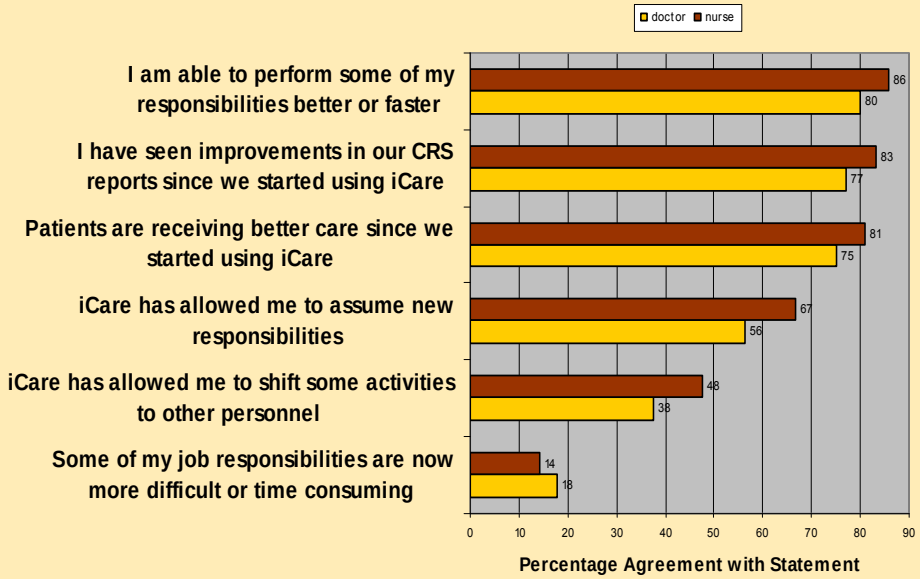
GUI Interfaces

iCare Population Management
Point of Care EHR
Clinical Reporting System
Quality of Care Reports
User Defined Query Tools
Best Practice Prompts
Reminders
Health Summaries
Patient Wellness Handout

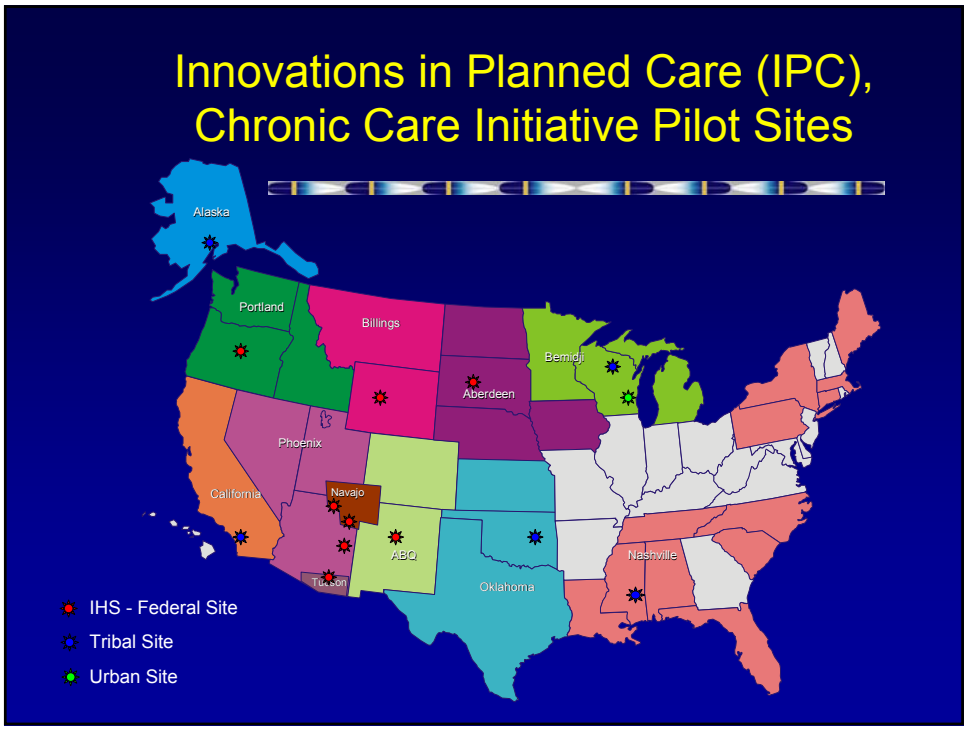
Case Management
Women's Health
Dental
Lab
Behavioral Health
Elder Care
Public Health Nursing
Health Factors
Measurements
Immunizations
Pt Education
Referred Care
Radiology
Emergency Room
Pharmacy

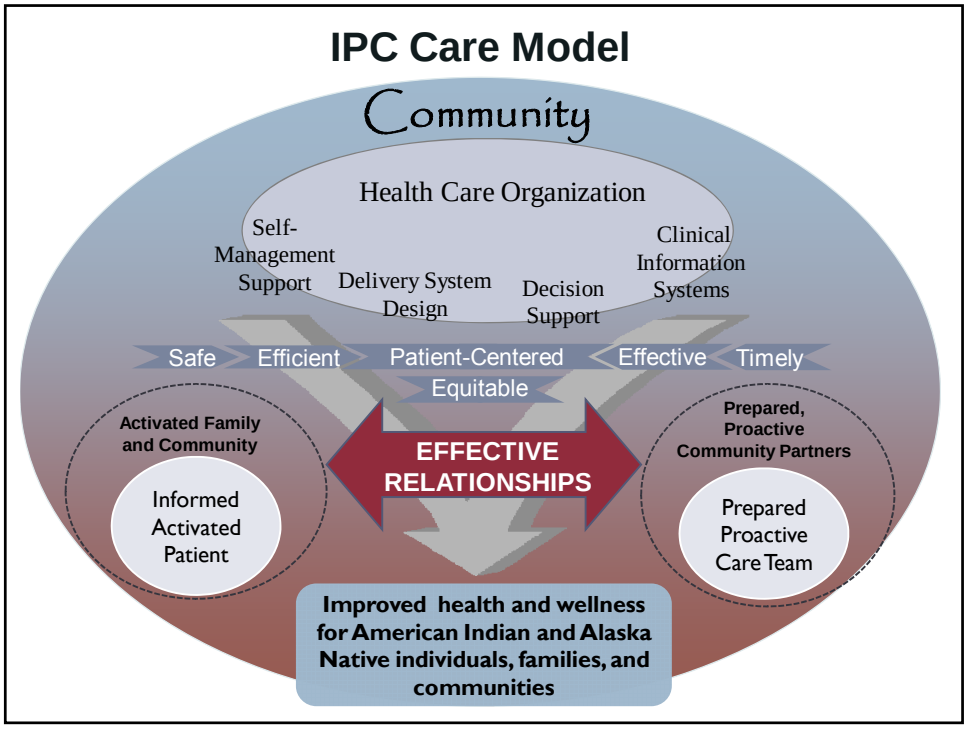
Patient Care Component

Evaluation Outcomes



Innovations in Planned Care (IPC), Chronic Care Initiative Pilot Sites





Management and Prevention of Chronic Conditions

- Diabetes
- Obesity
- Cardiovascular Disease
  - Ischemic heart disease / CAD
  - Dyslipidemia
  - Hypertension
- Depression
- Asthma
- Tobacco, alcohol, substance abuse
- Colorectal, cervical, breast cancer
- Immunizations
- Dental prevention

Chronic Condition Management

IHS examples

Summary and Close