

# HITECH: Advancing the Adoption of Electronic Health Records in the United States

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1

## Topics covered

- Information-related problems and solutions in healthcare
- Why do we need more informatics?
- Why are we not there?
- Details of HITECH Act programs
- The workforce need for informatics
- Educational and career opportunities in informatics



2

## Many problems in healthcare have information-related solutions

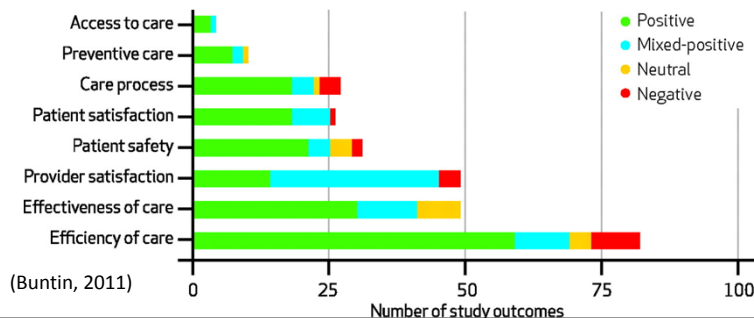
- Quality – not as good as it could be (McGlynn, 2003; Schoen, 2009; NCQA, 2010)
- Safety – errors cause morbidity and mortality; many preventable (Kohn, 2000; Van Den Bos, 2011)
- Cost – rising costs not sustainable; US spends more but gets less (Angrisano, 2007)
- Inaccessible information – missing information frequent in primary care (Smith, 2005)

3



## Growing evidence shows information interventions are part of the solution

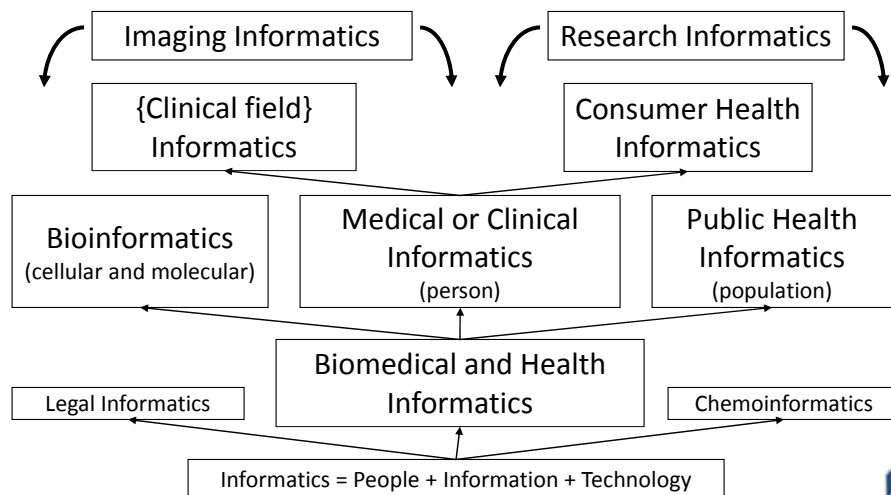
- Systematic reviews (Chaudhry, 2006; Goldzweig, 2009; Buntin, 2011) have identified benefits in a variety of areas
  - Although 18-25% of studies come from a small number of ‘health IT leader’ institutions



## Biomedical and health informatics is the science underlying the solutions

- *Biomedical and health informatics* (BMHI) is the science of using data and information, often aided by technology, to improve individual health, health care, public health, and biomedical research (Hersh, 2009)
  - It is about information, not technology
- Practitioners in BMHI are usually called *informaticians* (sometimes *informaticists*)

## BMHI has many sub-areas



## Informatics before the Obama era

- Growing recognition of value in healthcare
  - Evidence for improved safety, quality, and cost of healthcare
  - Widespread usage worldwide (Schoen, 2009; Protti, 2010)
  - Research and demonstration funding by NLM, AHRQ, and others
  - Actions of Bush Administration – e.g., appointment of first National Coordinator for HIT, establishment of AHIC, HITSP, etc.
- Emerging importance in other areas
  - Clinical and translational research – prominent role in CTSA programs (Zerhouni, 2007; Bernstam, 2009)
  - Genomics – bioinformatics, personalized medicine (Hamburg, 2010)
  - Individual health – growth of personal health records (PHRs) (Detmer, 2008), including from companies, e.g., Microsoft HealthVault, Google Health, etc.

## But then a new US president came along...



*“To lower health care cost, cut medical errors, and improve care, we’ll computerize the nation’s health records in five years, saving billions of dollars in health care costs and countless lives.”*

First Weekly Address  
Saturday, January 24, 2009

## ...and the US entered a new “ARRA”

- Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA)
  - Incentives for electronic health record (EHR) adoption by physicians and hospitals (up to \$27B)
  - Direct grants administered by federal agencies (\$2B)
- Other provisions in other areas of ARRA, e.g.,
  - Comparative effectiveness research
  - NIH and other research funding
  - Broadband and other infrastructure funding



9

## Why has it been so difficult to get there? (Hersh, 2004)

### Health Care Information Technology Progress and Barriers

William Hersh, MD

**I**N THE 3 DECADES SINCE THE TERM “MEDICAL INFORMATICS” was first used, individuals working at the intersection of information technology (IT) and medicine have developed and evaluated computer applications aimed

at improving patient care, and also cataloged the incomplete but encouraging underlying evidence.<sup>11</sup> As with many applications of IT, the technology can improve the existing situation but also empower clinicians and patients to think more fundamentally about how inno-

- Cost
- Technical challenges
- Interoperability
- Privacy and confidentiality
- Workforce

care IT.<sup>12</sup> It is no exaggeration to declare that the years ahead portend the “decade of health information technology.”<sup>13</sup> Informatics is poised to have a major impact in patient-clinician communication. In the Clinical Crossroads article

See also p 2255.

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ment. The rest goes to those who typically do not pay for

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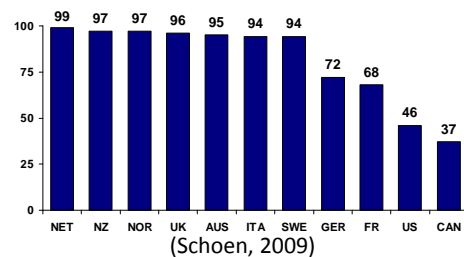
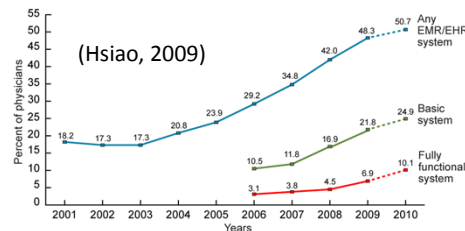
(Reprinted) JAMA, November 10, 2004—Vol 292, No. 18 2273





## US has low rates of adoption in inpatient and outpatient settings

- Adoption in the US is low for both outpatient (Hsiao, 2010) and inpatient settings (Jha, 2010)
- By most measures, US is a laggard and could learn from other countries (Schoen, 2009)
- Most other developed countries have undertaken ambitious efforts, e.g.,
  - England (Hayes, 2008)
  - Denmark (Protti, 2010)



11

## The new “ARRA” of health information technology (HIT) in the US

- HITECH provides financial incentives for “meaningful use” of HIT (Blumenthal, 2010; Blumenthal, 2010)
  - Incentives for EHR adoption by physicians and hospitals (up to \$27B)
  - Direct grants administered by federal agencies (\$2B)
  - All initiatives administered by the Office of the National Coordinator for Health IT (ONC, <http://healthit.hhs.gov/>)

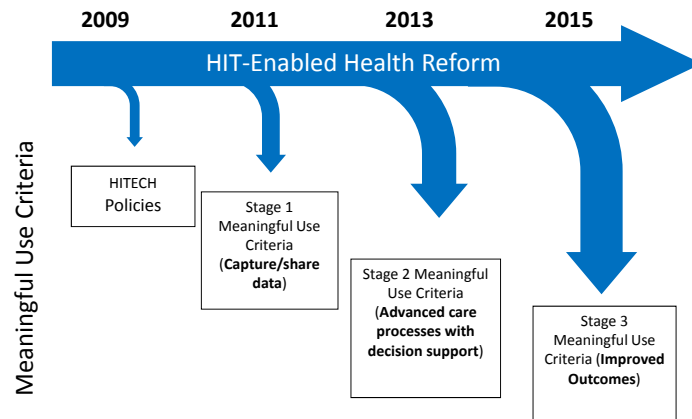
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## What is “meaningful use” (MU) of an EHR? (Stark, 2010; Blumenthal, 2010)

- Driven by five underlying goals for healthcare system
  - Improving quality, safety and efficiency
  - Engaging patients in their care
  - Increasing coordination of care
  - Improving the health status of the population
  - Ensuring privacy and security
- Consists of three requirements
  - Use of certified EHR technology in a meaningful manner
  - Utilize certified EHR technology connected for health information exchange (HIE)
  - Use of certified EHR technology to submit information on clinical quality measures

13

## MU being implemented in three stages



14

## Implementation of MU (Blumenthal, 2010)

- Implemented through increased Medicare or Medicaid reimbursement over five years to
  - Eligible professionals (EPs) – up to \$44K
  - Eligible hospitals (EHs) – \$2-9M
- There are differences in definitions of above as well as amounts for Medicare vs. Medicaid reimbursement
- Stage 1 final rules released in July, 2010 by CMS (2010) and ONC (2010)
  - Must achieve 14-15 core and 5 of 10 menu criteria
  - Summarized in Blumenthal (2010) and many other places

15



## Stage 1 core criteria (14 for EH; 15 for EP)

- >30% of unique patients have at least 1 med order entered using CPOE
- Drug-drug and drug-allergy interaction checks enabled
- >40% of all permissible prescriptions transmitted electronically (EP only, not EH)
- >50% of all unique patients have demographics recorded: preferred language, gender, race, ethnicity, dob
- >80% of all unique patients have at least 1 entry or indication of none on problem list
- >80% of all unique patients have at least 1 entry or indication of none on med list
- >80% of all unique patients have at least 1 entry or indication of none on med allergy list
- >50% of patients age 13+ seen have smoking status recorded

16



## Stage 1 core criteria (cont.)

- >50% of all unique patients age 2+ have recorded height, weight, blood pressure, calculated BMI, growth charts age 2-20
- Implement 1 clinical decision support rule relevant to specialty or high clinical priority with ability to track compliance
- Report quality measures to CMS – provide aggregate numerator, denominator, and exclusions
- >50% provide patients with an electronic copy of health info upon request within 3 business days
- Provide clinical summaries to patient for more than 50% of all office visits within 3 business days
- Performed at least 1 test of certified EHR technology's capacity to electronically exchange key clinical info
- Conduct or review a security risk analysis and implement security updates as necessary

17



## Stage 1 menu criteria (require five, one of which must be public health)

- Implement drug-formulary checks – at least 1 internal or external drug formulary for the entire reporting period
- >50% of all unique patients 65 or older have an indication of an advance directive status recorded
- >40% of all clinical lab tests ordered are in EHR as structured data
- Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research or outreach
- Use certified EHR technology to identify patient-specific education resources and provide to the patient if appropriate
- >50% of transitions of care and referrals by EH provide summary of care record for each transition of care or referral
- >50% of care transitions perform medication reconciliation
- Capability to submit electronic syndromic surveillance data to public health agencies and actual submission in accordance with applicable law and practice
- Capability to submit electronic immunization data to public health agencies
- Capability to submit electronic laboratory data to public health agencies

18



## Quality measures – differ for EP and EH but required for both

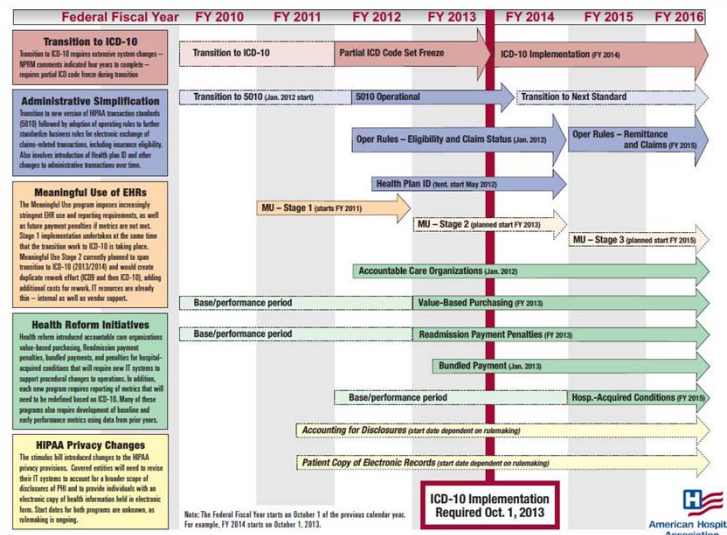
- EP (outpatient) – three required or alternate measures plus three of 13 others, e.g.,
  - Hypertension – blood pressure measurement
  - Tobacco use assessment and cessation intervention
  - Adult weight screening and follow-up
- EH (inpatient) – 15 required measures, e.g.,
  - Diabetes: Hemoglobin A1c, low-density lipoprotein, and blood pressure control
  - Influenza immunization for patients > 50 years old
  - Pneumonia vaccination status for older adults
  - Breast cancer screening
  - Colorectal cancer screening

19



## MU is just one of several challenges

### Overlapping Timelines of ICD-10, Meaningful Use of EHRs, and Health Reform Initiatives



<http://www.aha.org/advocacy-issues/hit/mu/overw-time.shtml>

## Other funding initiatives for the HIT infrastructure

- HIT Regional Extension Centers (RECs)
  - \$677 million to fund 62 RECs that will provide guidance, mainly to small primary care practices, in achieving meaningful use (Maxson, 2010)
- State-based health information exchange (HIE)
  - \$547 million in grants to states to develop HIE programs (Kuperman, 2011)
- Beacon communities
  - \$250 million to fund 17 communities that provide exemplary demonstration of the meaningful use of EHRs (McKethan, 2011)
- Strategic health information advanced research projects (SHARP)
  - \$60 million for four collaborative research centers

21



## Other funding for the infrastructure: HIT workforce

- A competent workforce is essential to achieve meaningful use of HIT
- ONC estimates 51,000 workers needed to implement federal HIT agenda (Monegain, 2009)
- ONC is funding \$118 million for
  - Community college consortia (\$70M)
  - Curriculum Development Centers (\$10M)
  - Competency testing (\$6M)
  - University-based training grants (\$32M)

22



## ONC workforce roles to implement the HITECH agenda

- Mobile Adoption Support Roles
  - Implementation support specialist\*
  - Practice workflow and information management redesign specialist\*
  - Clinician consultant\*
  - Implementation manager\*
- Permanent Staff of Health Care Delivery and Public Health Sites
  - Technical/software support staff\*
  - Trainer\*
  - Clinician/public health leader†
  - Health information management and exchange specialist†
  - Health information privacy and security specialist†
- Health Care and Public Health Informaticians
  - Research and development scientist†
  - Programmers and software engineer†
  - Health IT sub-specialist†

(to be trained in \*community colleges and †universities)

23



## ONC workforce development program

- Community College Consortia to Educate Health Information Technology Professionals Program (\$70M)
  - Five regional consortia of 82 community colleges developing short-term programs to train 10,000 individuals per year in the six community college workforce roles
- Curriculum Development Centers Program (\$10M)
  - Five universities collaboratively developing (with community college partners) HIT curricula for 20 components (topics)
  - One of the five (OHSU) additionally funded as National Training and Dissemination Center
- Competency Examination for Community College Programs (\$6M)
  - Developing competency examinations based on the six community college workforce roles
- Program of Assistance for University-Based Training (\$32M)
  - Funding education of individuals in workforce roles requiring university-level training at nine universities (including OHSU)
  - Emphasis on short-term certificate programs delivered via distance learning

24



## Who are the HIT workforce and what do know about them? (Hersh, 2010)

- Three historical groups of professionals in HIT
  - Information technology (IT) – usually with computer science or information systems background
  - Health information management (HIM) – historical focus on medical records
  - Clinical informatics (CI) – often from healthcare backgrounds
- Problematic HIT implementations often attributable to lack of understanding of clinical environment and use of IT within it (Leviss, 2010)

25



## How many IT personnel does the US have and need?

- IT – to reach level of known benefit and meaningful use, may need 40,000 (Hersh, 2008)
- HIM – from US Bureau of Labor Statistics occupational employment projections 2008-2018 (BLS, 2009)
  - Medical Records and Health Information Technicians (RHITs and coders) – about 172,500 employed now, increasing to 207,600 by 2018 (20% growth)
- CI – estimates less clear for this emerging field
  - One physician and nurse in each US hospital (~10,000) (Safran, 2005)
  - About 13,000 in health care (Friedman, 2008) and 1,000 in public health (Friedman, 2007)
  - Growing role of CMIO and other CI leaders (Leviss, 2006; Shaffer, 2010)

26





## Other important workforce developments

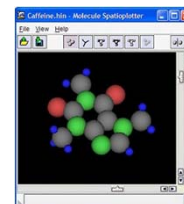
- Physicians
  - Proposal to establish a clinical informatics subspecialty (Detmer, 2010) based on core curriculum (Gardner, 2009) and training requirements (Safran, 2009)
- Other health professionals
  - Nursing – TIGER initiative (Gugerty, 2009)
  - HIM (Wilhelm, 2007; Dimick, 2008)
  - Nutrition (Hogge, 2010)

27



## Opportunities in BMHI are not limited to healthcare

- Bioinformatics – genomics and personalized medicine
- Clinical and translational research – building a “learning” healthcare system
- Public health – protecting the public and promoting health, e.g., H1N1 surveillance
- Consumer health – for all ages, especially aging Internet-savvy baby boomers
- Imaging informatics – use of images for biomedical research, clinical care, etc.



28



## Conclusions

- The grand experiment of HITECH is going on in the US – results not yet in
- BMHI is an important science and profession for improving health, healthcare, public health, and biomedical research with data and information
  - Most resources in clinical informatics but plenty of other opportunity in bioinformatics, public health informatics, consumer health informatics, clinical research informatics, imaging informatics, etc.
- There are many opportunities for practitioners, researchers, and others in BMHI

29



## For more information

- Bill Hersh
  - <http://www.billhersh.info>
- Informatics Professor blog
  - <http://informaticsprofessor.blogspot.com>
- OHSU Department of Medical Informatics & Clinical Epidemiology (DMICE)
  - <http://www.ohsu.edu/informatics>
  - <http://oninformatics.com>
- OHSU financial aid for informatics training
  - <http://www.informatics-scholarship.info>
- What is BMHI?
  - <http://www.billhersh.info/whatis>
- Office of the National Coordinator for Health IT (ONC)
  - <http://healthit.hhs.gov>
- American Medical Informatics Association (AMIA)
  - <http://www.amia.org>

30

