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

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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

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

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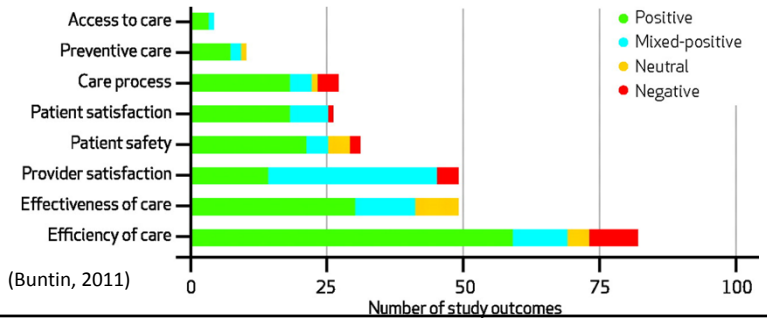
Growing evidence shows information interventions are part of the solution

- 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



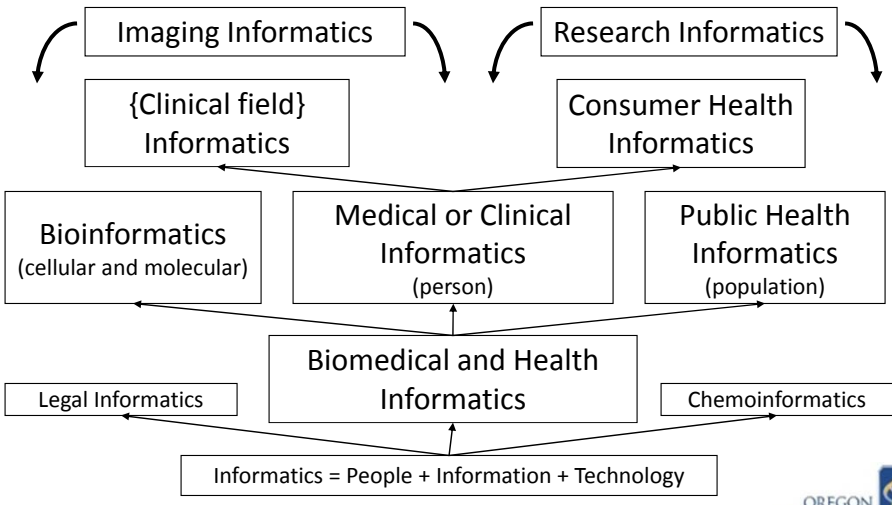
(Buntin, 2011)

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 are BMHI are usually called *informaticians* (sometimes *informaticists*)

5

BMHI has many sub-areas



6

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.

7

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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

8

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…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

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

Health Care Information Technology
Progress and Barriers

William Hersh, MD

IN 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 aim-

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

care IT.[8,9] It is no exaggeration to declare that the years ahead portend the "decade of health information technology."[10]

Informatics is poised to have a major impact in patient-clinician communication. In the Clinical Crossroads article in this issue of JAMA, Slack demonstrates the value that patient-physician e-mail can have in improving patient care, and also catalogs the incomplete but encouraging underlying evidence.[11] 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-

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

See also p 2255.

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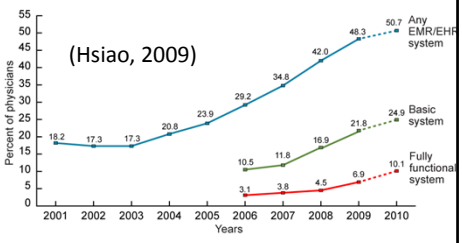
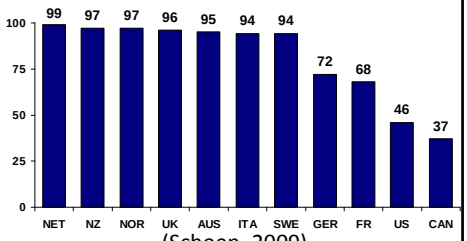
US has low rates of adoption in inpatient and outpatient settings

- 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)





(Schoen, 2009)

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/)

12

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

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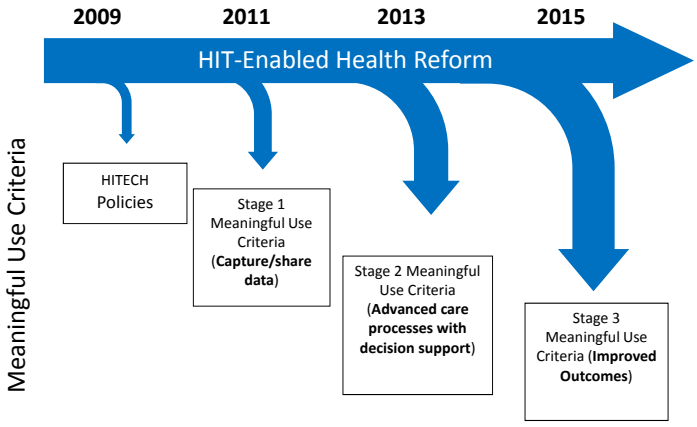
MU being implemented in three stages



14

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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

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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

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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

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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

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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

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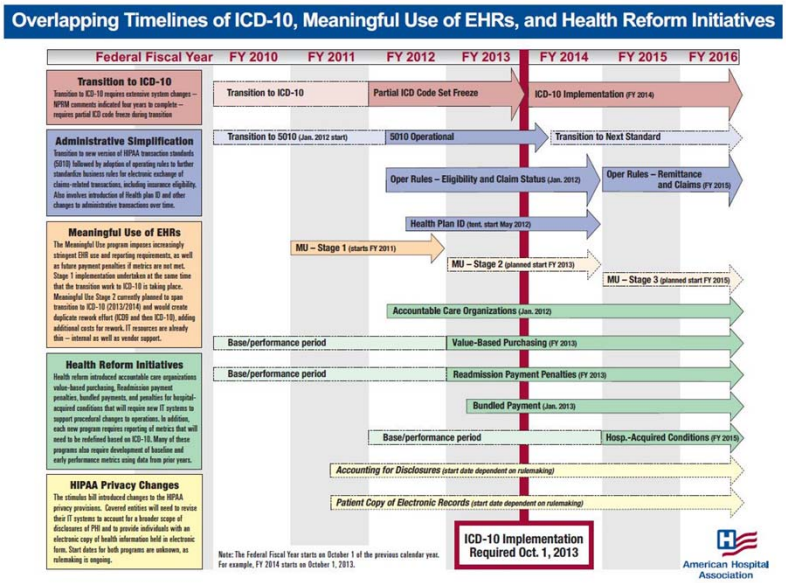
MU is just one of several challenges



http://www.aha.org/advocacy-issues/hit/mu/overvw-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

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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)

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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)

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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

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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

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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

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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 (Hoggle, 2010)

27

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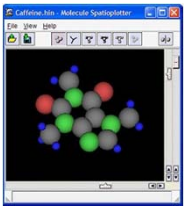
Opportunities in BMHI are <u>not</u> limited to healthcare

- 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

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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

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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

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