Informatics Now Lives in a HITECH World

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Overview of talk

- A new "ARRA" for informatics
- The role of OHSU in HITECH
- Is there a role for bioinformatics, clinical research informatics, public health informatics? *Yes!*

Informatics did exist before HITECH

- Growing recognition of value in healthcare
  - Evidence for improved safety, quality, and cost of healthcare (Chaudhry, 2006; Goldzweig, 2009)
  - Research and demonstration funding by NLM, AHRQ
  - Actions of Bush Administration – e.g., appointment of first National Coordinator for HIT, establishment of AHIC, HITSP, CCHIT, etc.
- Emerging importance in other areas
  - Clinical and translational research – prominent role in CTSA programs (Bernstam, 2009)
  - Genomics – bioinformatics, personalized medicine (Ng, 2009)
  - Individual health – growth of personal health records (PHRs), e.g., Microsoft HealthVault, Google Health, etc. (Detmer, 2008)
  - Public health – surveillance, health promotion (Kukafka, 2007)

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But then a new 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

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…and we 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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Motivations – why do we need more information technology (IT) in healthcare?

- Quality – not as good as it could be (McGlynn, 2003; NCQA, 2009; Schoen, 2009)
- Safety – IOM "errors report" found up to 98,000 deaths per year (Kohn, 2000)
- Cost – rising costs not sustainable; US spends more but gets less (Angrisano, 2007)
- Inaccessible information – missing information frequent in primary care (Smith, 2005)

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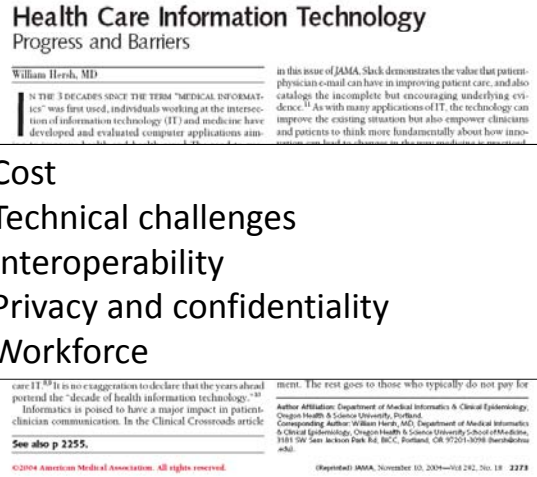
How can informatics help?

- Stead (Academic Medicine, 2010)
  - Quantity and complexity of information in medicine requires a fundamental paradigm shift as the number of facts per decision rises
  - Academic health centers should take the lead in developing informatics faculty and serving as laboratories for innovation
- Shortliffe (JAMA, 2010)
  - Focus of medical practice is as much on information as patients, yet we teach very little about it, including its acquisition (EHRs, searching) and use (quality, safety)

Is there evidence that informatics can help?

- Systematic reviews (Chaudhry, 2006; Goldzweig, 2009) have identified benefits
  - Adherence to guideline-based care
  - Enhanced surveillance and monitoring
  - Decreased medical errors
- Caveat: 20-25% of studies came from 4 institutions and there have been few studies of commercial systems
  - Concerns about generalizability
  - One recent study of 41 urban hospitals in Texas found those with EHR and clinical decision support had improved clinical outcomes and lower costs (Amarasingham, 2009)
  - Another study showed decreased mortality after CPOE implementation (Longhurst, 2010; reversal of Han, 2005)

Why are we not there? What are the barriers? (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-

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.[1] 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-

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

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

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See also p 2255.

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

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

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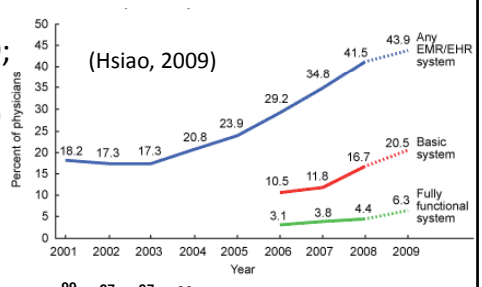
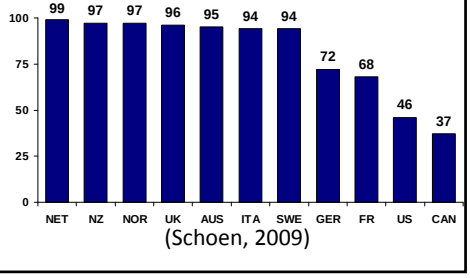
US has low rates of adoption in inpatient and outpatient settings

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





(Schoen, 2009)

But now we are in a new "ARRA" of health information technology (HIT)

- HITECH provides financial incentives for "meaningful use" (MU) of HIT
  - Incentives for EHR adoption by physicians and hospitals (up to $27B)
  - Direct grants administered by federal agencies ($2B)
  - All initiatives overseen by Office of the National Coordinator for Health IT (ONC, http://healthit.hhs.gov/)
  - Headed by Dr. David Blumenthal (NEJM, 2009; NEJM, 2010; NEJM, 2010)

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What is "meaningful use" of an EHR?

- 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

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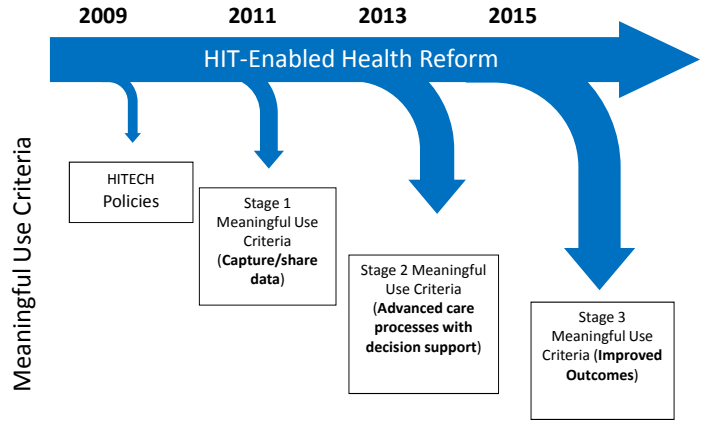
MU will be implemented in three stages



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Implementation of MU

- Implemented through Medicare or Medicaid reimbursement to
  - Eligible professionals (EPs) – up to $44K
  - Eligible hospitals (EHs) – $2-9M
- Differences in definitions of above as well as amounts for Medicare vs. Medicaid reimbursement
- Elaborated in final rules released in July, 2010 by CMS (2010) and ONC (2010)
  - Must achieve 14-15 core and 5 of 10 menu criteria

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Phase 1 MU criteria

- Variety of criteria in areas of
  - Data collection – e.g., problem list, demographics, etc.
  - Functions – e.g., clinical decision support rule, computerized provider order entry (CPOE)
  - Health information exchange – test of capability
  - Public health reporting – at least one criteria required
  - Security – various encryption and network standards
  - Quality reporting – various measures for EPs based on specialty and for EHs

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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
- State-based health information exchange (HIE)
  - $548 million in 62 grants to states to develop HIE programs
- Beacon communities
  - $265 million to fund 17 communities that provide exemplary demonstration of the meaningful use of EHRs
- 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 MU (Leviss, 2009; Zywiak, 2010)
- ONC estimates 50,000 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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Who is the HIT workforce?

- Three historical groups of HIT professionals
  - 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

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Why do we need a competent informatics workforce?

- Case study: implementation of computerized physician order entry (CPOE) showed adverse consequences
  - Mortality rate increased from 2.8% to 6.6% at Children's Hospital of Pittsburgh Pediatric ICU (Han,2005)
  - Increased mortality not seen at other academic centers (Del Baccaro, 2006; Jacobs, 2006) and one recent study shows positive benefits (Longhurst, 2010)
  - Pittsburgh adverse outcome may have been avoided with adherence to known "best practices" (Phibbs, 2005; Sittig, 2006)
- Problematic health IT implementations well-known, with failure often attributable to lack of understanding of clinical environment (Leviss, 2010)
- Also need to anticipate and overcome "unintended consequences" (Ash, 2004)

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How many IT personnel do we have and do we 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)
  - Medical subspecialty likely forthcoming (Detmer, 2010)

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ONC workforce program based on anticipated 12 workforce roles

- 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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Community College Consortia to Educate HIT Professionals Program

- Five regional consortia of 84 community colleges to develop short-term programs to train 10,000 individuals per year in the six community college job roles
- Anticipated enrollment of people with healthcare and/or IT backgrounds – probably baccalaureate or higher degrees

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Curriculum Development Centers Program

- Five universities to collaboratively develop (with community college partners) HIT curricula for 20 components (topics)
  - Oregon Health & Science University (OHSU)
  - Columbia University
  - Johns Hopkins University
  - Duke University
  - University of Alabama Birmingham
- One of the five centers (OHSU) additionally funded as National Training and Dissemination Center
  - Training – event for about 210 community college faculty held August 9-11, 2010
  - Dissemination – Web site and feedback collection for curricula

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The 20 components of the HIT curriculum

- Introduction to Health Care and Public Health in the U.S
- The Culture of Health Care
- Terminology in Health Care and Public Health Settings
- Introduction to Information and Computer Science
- History of Health Information Technology in the U.S.
- Health Management Information Systems
- Working with Health IT Systems
- Installation and Maintenance of Health IT systems
- Networking and Health Information Exchange
- Fundamentals of Health Workflow Process Analysis & Redesign
- Configuring EHRs
- Quality Improvement
- Public Health IT
- Special Topics Course on Vendor-Specific Systems
- Usability and Human Factors
- Professionalism/Customer Service in the Health Environment
- Working in Teams
- Planning, Management and Leadership for Health IT
- Introduction to Project Management
- Training and Instructional Design

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Program of Assistance for University-Based Training (UBT)

- Funding for education of individuals in job roles requiring university-level training at nine universities with existing programs
  - Oregon Health & Science University (OHSU)
  - Columbia University
  - University of Colorado Denver College of Nursing
  - Duke University
  - George Washington University
  - Indiana University
  - Johns Hopkins University
  - University of Minnesota (consortium)
  - Texas State University (consortium)
- Emphasis on short-term certificate programs delivered via distance learning
- OHSU program being run as "scholarship" program for existing Graduate Certificate and Master of Biomedical Informatics programs

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HITECH builds on OHSU leadership role

- Already a leader and innovator in
  - Clinical informatics
    - Thought leader on the role of the informatics practitioner and their education
    - Innovative initiatives such as AMIA 10x10 ("ten by ten") program (Hersh, 2007; Feldman, 2008)
    - Research accomplishments in a diversity of areas
  - Bioinformatics and Computational Biology
    - Prominence in Clinical and Translational Science Award (CTSA) informatics program – "seeding" approach
    - Highly collaborative research and educational programs
- Has catapulted DMICE to second among departments in FY 2010 sponsored project funding in OHSU School of Medicine

AMIA 10x10™ 10,000 Trained by 2010

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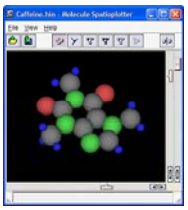
HITECH is focused on EHRs but touches on all areas of biomedical informatics

- Bioinformatics – genomics and personalized medicine
- Clinical and translational research – CTSA and other programs 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.



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Conclusions

- Informatics now lives in a HITECH world
  - Our half-century old field is maturing
  - Growing opportunities, especially for practitioners/professionals
- Investment and employment will be largest in clinical informatics, which will be augmented by
  - $1000 genome and other data impacting clinical medicine
  - Continued emphasis on translational research and comparative effectiveness research closing loop on research and practice
  - Public health activities augmented by clinical data
  - Aging baby boomers demanding to manage their health as they do their finances, purchases, travel, etc.
- Stay tuned for the results of this grand experiment!

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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/dmice
  - 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