The Grand Experiment of HITECH: Results and Future Directions

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Disclosures

- Conflict of interest
  - None (although I teach informatics for a living)
- Accreditation
  - Oregon Health & Science University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians
- Credit
  - OHSU School of Medicine, Division of CME, designates this live activity for a maximum of 1 AMA PRA Category 1 Credit™
  - Physicians should claim only the credit commensurate with the extent of their participation in the activity
  - Forms available for those wanting CME credit

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Learning objectives

- In 2009, the Health Information Technology for Economic and Clinical Health (HITECH) Act invested $30 billion toward widespread adoption of electronic health records. The speaker called it at the time a "grand experiment" for healthcare. Six years later, the results are in. In this talk, the speaker will:
  - Describe the rationale for the HITECH investment
  - Present the beneficial and problematic results of the investment
  - Discuss how the electronic health record can meet its goals

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Outline – a scientific paper

- Introduction – problems and solutions addressed by the electronic health record (EHR)
- Methods – Health Information Technology for Economic and Clinical Health (HITECH) Act
- Results – good and bad
- Discussion – moving forward from here

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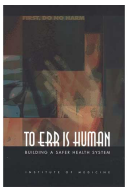
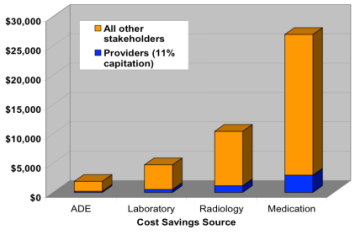
A decade ago, information problems in healthcare we re well-known

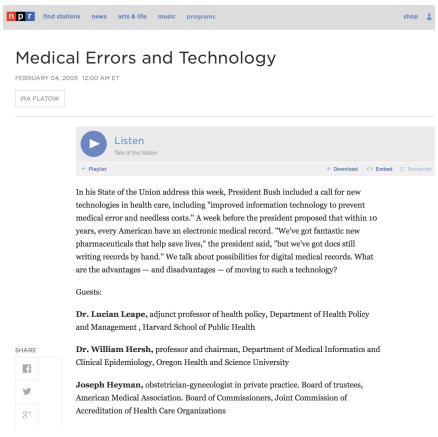
- Safety – IOM "errors report" documented 48-96K deaths per year due to medical errors (Kohn, 2000)
- Quality – patients received appropriate care only 55% of time (McGlynn, 2003)
- Cost
  - EHRs cost-effective overall, but benefits did not accrue to those making the investment (Johnston, 2003)
  - Widespread interoperable EHRs could save $77B per year (Hillestad, 2005)
- Access to information – physicians unable to access known information about patients in 44% of ambulatory visits (Smith, 2005)





Solution seemed simple: Interoperable EHRs!

- Many made the case, e.g.,
  - http://www.npr.org/templates/story/story.php?storyId=4486530
- Could allow additional value via "secondary use" (Safran, 2007)
- Implementing the learning health system (Friedman, 2010)



Medical Errors and Technology

FEBRUARY 04, 2005 12:00 AM ET

IRA FLATOW

Listen

In his State of the Union address this week, President Bush included a call for new technologies in health care, including "improved information technology to prevent medical error and needless costs." A week before the president proposed that within 10 years, every American have an electronic medical record. "We've got fantastic new pharmaceuticals that help save lives," the president said, "but we've got docs still writing records by hand." We talk about possibilities for digital medical records. What are the advantages — and disadvantages — of moving to such a technology?

Guests:

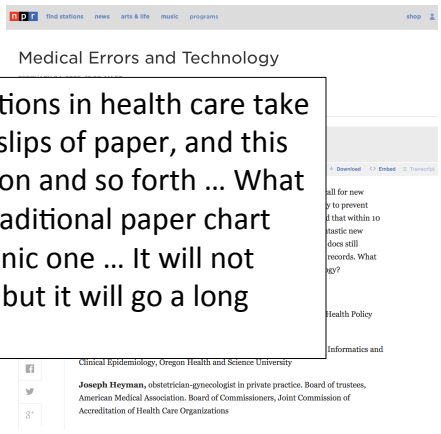
Dr. Lucian Leape, adjunct professor of health policy, Department of Health Policy and Management , Harvard School of Public Health

Dr. William Hersh, professor and chairman, Department of Medical Informatics and Clinical Epidemiology, Oregon Health and Science University

Joseph Heyman, obstetrician-gynecologist in private practice. Board of trustees, American Medical Association. Board of Commissioners, Joint Commission of Accreditation of Health Care Organizations

Solution seemed simple: Interoperable EHRs!

What we have now is most transactions in health care take place on paper, whether it's fax or slips of paper, and this leads … to medical errors, duplication and so forth … What we're advocating is replacing the traditional paper chart and all its problems with an electronic one … It will not solve all the problems in medicine, but it will go a long ways towards solving some.



What was holding us back? (Hersh, 2004)


Health Care Information Technology
Progress and Barriers

William Hersh, MD

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

American Recovery and Reinvestment Act (ARRA) provided the opportunity

"To improve the quality of our health care while lowering its cost, we will make the immediate investments necessary to ensure that within five years, all of America's medical records are computerized … It just won't save billions of dollars and thousands of jobs – it will save lives by reducing the deadly but preventable medical errors that pervade our health care system."

January 5, 2009

HITECH Act (Blumenthal, 2011)

- Incentives for EHR adoption by physicians and hospitals (up to $27B)
- Direct grants by federal agencies ($2B, including $118M for workforce development)

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And informatics entered the HITECH world

INFORMATICS PROFESSOR

THIS BLOG MAINTAINS THE THOUGHTS ON VARIOUS TOPICS RELATED TO BIOMEDICAL AND HEALTH INFORMATICS BY DR. WILLIAM HERSH, PROFESSOR AND CHAIR, DEPARTMENT OF MEDICAL INFORMATICS & CLINICAL EPIDEMIOLOGY, OREGON HEALTH & SCIENCE UNIVERSITY.

SUNDAY, JANUARY 24, 2010

Informatics Now Lives in a HITECH World

The flurry of activity from the Office of the National Coordinator for Health IT (ONC) in late 2009 laid out the implementation plans of the Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA, also known as the economic stimulus package). The scope of programs was so immense that few aspects of the biomedical and health informatics field will be unaffected by HITECH. I think we can plainly say that informatics now lives in a HITECH world.

WILLIAM HERSH

http://www.billhersh.info/

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And informatics entered the HITECH world

INFORMATICS PROFESSOR

This is a defining moment for the informatics field. Never before has such money and attention been lavished on it. HITECH provides a clear challenge for the field to "get it right." It will be interesting to look back on this time in the years ahead and see what worked and did not work. Whatever does happen, it is clear that informatics lives in a HITECH world now.

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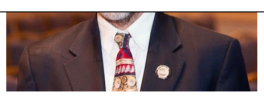

http://www.billhersh.info/

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What did HITECH entail?

- Incentives for "meaningful use" (MU) of the EHR, which required (Blumenthal, 2010)
  - Eligible hospitals and professionals meeting criteria in three stages
  - Using certified EHR technology
  - Adhering to specified standards
  - Able to measure and send quality measures as well as enable health information exchange (HIE)

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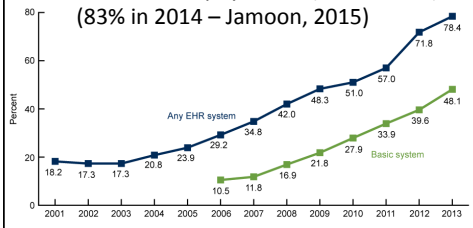
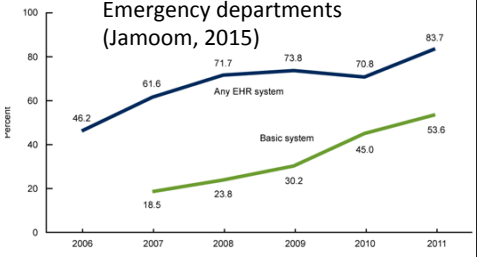
Led to substantial EHR adoption

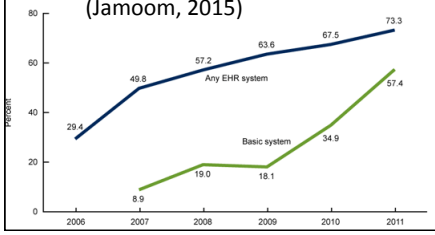
Office-based physicians (Hsiao, 2014)
(83% in 2014 – Jamoon, 2015)



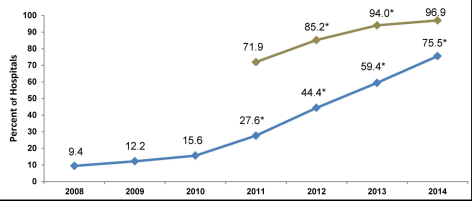
Emergency departments
(Jamoom, 2015)



Outpatient departments
(Jamoom, 2015)



Non-federal hospitals
(Charles, 2014)



Although adoption increased, other problems arose

- Incomplete interoperability
- Adverse impact on workflow
- Conundrum of structured vs. unstructured data
- Problems with usability
- Safety
- Security

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Lack of interoperability

- Despite large-scale adoption, systems do not communicate well
- Several causes
  - Incomplete adoption of standards
  - JASON report criticized lack of use of "modern" API-based approaches (MITRE, 2014)
    - ONC established JASON Task Force to respond to recommendations
  - Information blocking (ONC, 2015; ASCO, 2015)

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Adverse impact on workflow

- Famous JAMA cartoon (Toll, 2012)
- Too much focus on computer than patient – "writing the wrong" (Patel, 2015)
- Dr. Paul Chang and the "demise of radiology rounds" (Jersild, 2012)
- Facilitates workarounds, such as copy-and-paste (or "sloppy and paste" [O'Reilly, 2013]?)

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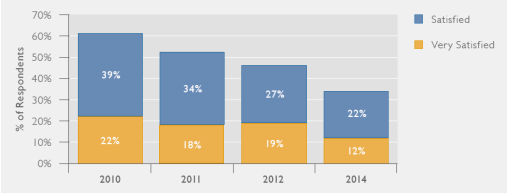
Usability

- Substantial physician dissatisfaction (AmericanEHR, 2014)
- Partly due to conundrum of structured vs. unstructured data
  - Structured data facilitates re-use
  - Narrative data tells the patient's story
    - "Patients do not speak template" (Lewis, 2011)
    - Many physicians do not trust check boxes and the like (Personal Communications)
- Vendors not adhering to usability requirements as part of ONC EHR certification (Ratwani, 2015)



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RESEARCH REPORT

Factors Affecting Physician Professional Satisfaction and Their Implications for Patient Care, Health Systems, and Health Policy

Mark W. Friedberg • Peggy G. Chen • Kristin R. Van Busum • Frances M. Aunon
Chau Pham • John P. Caloyeras • Soeren Mattke • Emma Pitchforth
Denise D. Quigley • Robert H. Brook • F. Jay Crosson • Michael Tutty

The Pros and Cons of Electronic Health Records

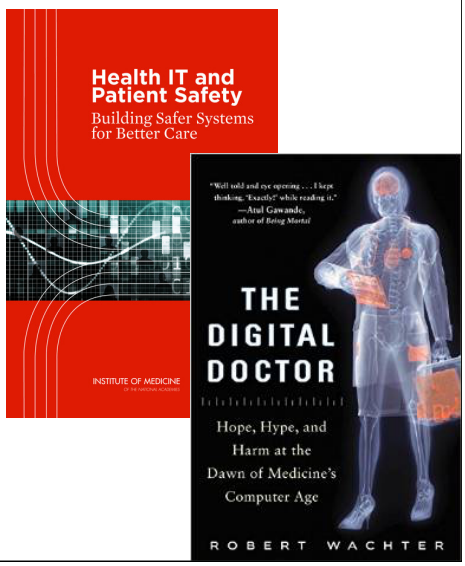
- Physicians approved of EHRs in concept and appreciated having better ability to remotely access patient information and improvements in quality of care.
- However, for many physicians, the current state of EHR technology significantly worsened professional satisfaction in multiple ways.
- Aspects of current EHRs that were particularly common sources of dissatisfaction included poor usability, time-consuming data entry, interference with face-to-face patient care, inefficient and less fulfilling work content, inability to exchange health information, and degradation of clinical documentation.

RAND CORPORATION

AMA AMERICAN MEDICAL ASSOCIATION

The same EHRs we tout for safety may undermine it

- Concerns led to Joint Commission Sentinel Event alerts (42, 2008; 54, 2015)
- IOM report called for more effective monitoring and study (IOM, 2012), including a roadmap for avoiding e-iatrogenesis (Ash, 2012)
- Well-known mishaps
  - 38 times dose of antibiotic (Wachter, 2015)
  - Ebola patient in Dallas hospital (Cortese, 2015)



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Security

- 2015 has been the year of major breaches
  - Anthem – over 80M records (Rubenfire, 2015)
  - Premera Blue Cross – over 11M records (Vinton, 2015)
  - Excellus Blue Cross – over 10M records (Rubenfire, 2015)
  - And many more: 81% of health IT leaders report systems compromised in last 24 months (KPMG, 2015)
- Not limited to healthcare
  - https://www.opm.gov/cybersecurity

"Your previous provider refused to share your electronic medical records, but not to worry —I was able to obtain all of your information online."

(2-for-1, NewYorker)

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Total despair? No!

- There is still research evidence that health IT improves care
- Emerging models for more effective use
- Calls and action for improved usability, interoperability
- Robust opportunities, especially related to data science/analytics

thinkgeek.com

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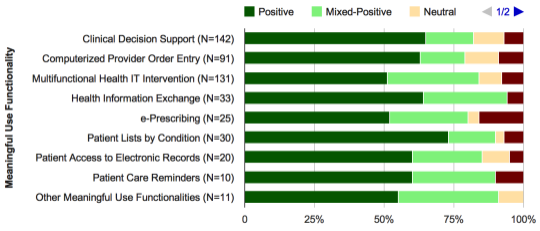
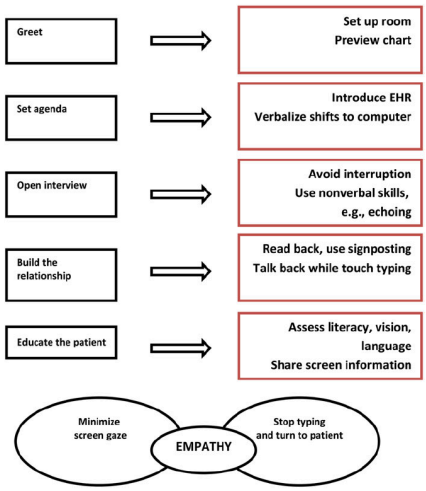
There is still a (mostly) positive evidence base (Jones, 2014)



Author Sentiment of Meaningful Use Functionality					
Meaningful Use Functionality	Number of MU Impacts	Positive	Mixed-Positive	Neutral	Negative
Clinical Decisions Support	142	65%	17%	11%	7%
Computerized Provider Order Entry	91	63%	16%	12%	9%
Multifunctional Health IT Intervention	131	51%	33%	8%	8%
Health Information Exchange	33	64%	30%	0%	6%
e-Prescribing	25	52%	28%	4%	16%
Patient Lists by Condition	30	73%	17%	3%	7%
Patient Access to Electronic Records	20	60%	25%	10%	5%
Patient Care Reminders	10	60%	30%	0%	10%
Other Meaningful Use Functionalities	11	55%	36%	9%	0%

There are emerging models for exam room use (Duke, 2013)



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Growing advocacy for improved usability and interoperability

- AMA usability principles (AMA, 2014)
- AMIA white paper (Payne, 2015)
- ACP documentation (Kuhn, 2015)
- ONC Interoperability Roadmap (ONC, 2015)

- Or should we declare victory and go home?
  - http://geekdoctor.blogspot.com/2015/05/21st-century-cures-act.html
  - http://community.the-hospitalist.org/2014/11/13/meaningful-use-born-2009-died-2014/

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Improving Care: Priorities to Improve Electronic Health Record Usability

EXECUTIVE SUMMARY

The American Medical Association (AMA) recognizes the potential value of electronic health records (EHRs) Effec Tripl (incl of pc care. how gene poor clinic

- Enhance Physicians' Ability to Provide High-Quality Patient Care
- Support Team-Based Care
- Promote Care Coordination
- Offer Product Modularity and Configurability
- Reduce Cognitive Workload
- Promote Data Liquidity
- Facilitate Digital and Mobile Patient Engagement
- Expedite User Input into Product Design and Post-Implementation Feedback

have identified this national priority and have made recommendations to improve usability.[3] The AMA adds to sired d ently rch

25 to advance EHR usability through understanding and

Report of the AMIA EHR 2020 Task Force on the Status and Future Direction of EHRs

Thomas H. Payne,[1] Sarah Corley,[2] Theresa A. Cullen,[3] Tejal K. Gandhi,[4] Linda Harrington,[5] Gilad J. Kuperman,[6] John E. Mattison,[7] David P. McCallie,[8] Clement J. McDonald,[9] Paul C. Tang,[10] William M. Tierney,[11] Charlotte Weaver,[12] Charlene R. Weir,[13] Michael H. Zaroukian[14]

AMIA INFORMATICS PROFESSIONALS. LEADING THE WAY. OXFORD UNIVERSITY PRESS

1. Improve documentation requirements and functionality to empower patients
2. Refocus regulations so that patients and their caregivers can derive the most benefit
3. Increase transparency
4. Foster innovation
5. Support person-centered care

Over envi Ince there resu are cons tera to Inter desp to a In p in cl

EHRs has created. Clinicians ask for help getting through their days, which often extend into evenings devoted to writing

to reconcile medications that some providers feel add to their workload and slow them down. Informed by careful stud-

AMIA POSITI

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Annals of Internal Medicine POSITION PAPER

Clinical Documentation in the 21st Century: Executive Summary of a Policy Position Paper From the American College of Physicians

Thomson Kuhn, MA; Peter Basch, MD; Michael Barr, MD, MBA; and Thomas Yackel, MD, MPH, MS, for the Medical Informatics Committee of the American College of Physicians*

Clinical documentation was developed to track a patient's condition and communicate the author's actions and thoughts to

used for clinical documentation is inadequate. The Medical Informatics Committee of the American College of Physicians has un-

- The primary purpose of clinical documentation should be to support patient care and improve clinical outcomes through enhanced communication.
- As value-based care and accountable care models grow, the primary purpose of the EHR should remain the facilitation of seamless patient care to improve outcomes while contributing to data collection that supports necessary analyses.
- Structured data should be captured only where they are useful in care delivery or essential for quality assessment or reporting.
- Patient access to progress notes, as well as the rest of their medical records, may offer a way to improve both patient engagement and quality of care.

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- Fast Health Interoperability Resources (FHIR)
- OAuth2 security
- Interoperability Standards Advisory (ISA) catalogs "ready" standards
- Argonaut Project (HL7) developing API and core data services based on FHIR

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Or should we declare victory and go home?

http://geekdoctor.blogspot.com/2015/05/21st-century-cures-act.html

http://community.the-hospitalist.org/2014/11/13/meaningful-use-born-2009-died-2014/

Opportunities

- Optimists note the "data dividend" of MU (Perlin, in Walsh, 2015)
- Predictive analytics has potential to augment modern clinical practice (Sniderman, 2015)
- Rationale for EHRs still exists
  - Diagnostic (IOM, 2015) and therapeutic (James, 2013) errors still abound; informatics part of the solution
  - Precision medicine will require EHRs and mobile devices to build 1M patient cohort (NIH, 2015)
- Growing need for
  - Clinical informaticians, including but not limited to the new physician subspecialty (Detmer, 2014)
  - Data scientists, and the 5-10 fold data users and managers around them (Manyika, 2011; IDC, 2014)

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Conclusions

- MU has been a mixed bag
  - Substantial adoption, yet
    - Suboptimal systems
    - Inadequate interoperability
- Does informatics share in the blame of unsuccessful EHRs?
  - Yes
- What are the solutions?
  - Mine: Leadership and responsibility, solving the conundrums
  - Yours?

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