

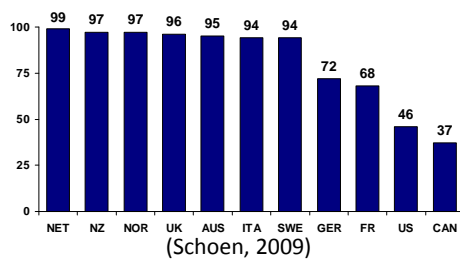
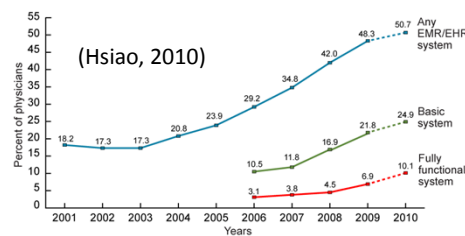
# What is Biomedical and Health Informatics? (5/7)

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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)



## Emerging national consensus is that we need more – starts at the top

- Started with President George W. Bush
  - State of the Union – mentioned every year 2004-2007
    - January, 2004 – “Computerizing health records [can] reduce costs, improve care, and lower the risk of medical mistakes.”
    - January, 2007 – “We need to reduce costs and medical errors with better information technology.”
  - Goal of (EHRs) for all Americans by 2014
    - <http://www.whitehouse.gov/news/releases/2005/01/20050127-2.html>
- Was elevated to even higher priority by President Barack Obama in HITECH Act (ARRA, 2009)

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## We are now in a new “ARRA” of health information technology (HIT)

- HITECH provides financial incentives for “meaningful use” of HIT
  - Incentives for EHR adoption by physicians and hospitals (up to \$29B)
  - Direct grants administered by federal agencies (\$2B)
- All initiatives overseen by Office of the National Coordinator for Health IT (ONC, <http://healthit.hhs.gov/>)

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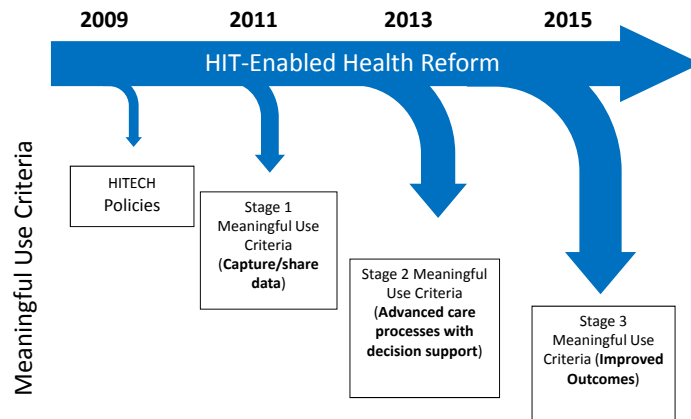
## What is “meaningful use” (MU) of an EHR? (Stark, 2010; Blumenthal, 2010)

- 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

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## MU being implemented in three stages



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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

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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 medication list
- >80% of all unique patients have at least 1 entry or indication of none on medication allergy list
- >50% of patients age 13+ seen have smoking status recorded

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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 information 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 information
- Conduct or review a security risk analysis and implement security updates as necessary

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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

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

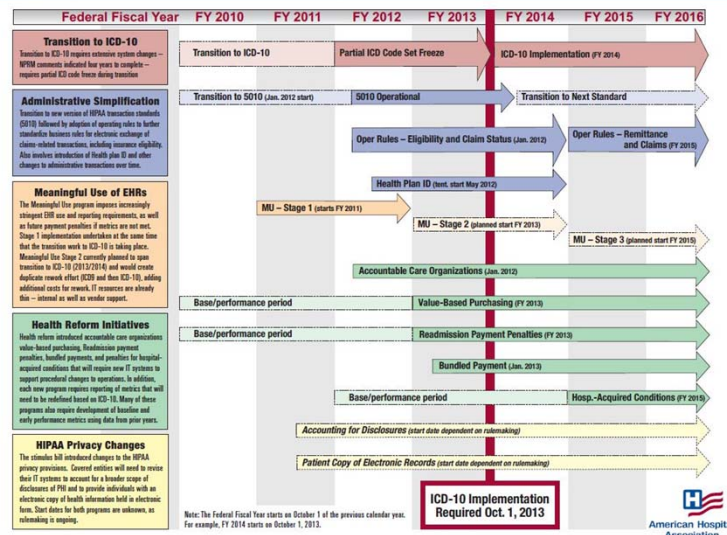
- EP (outpatient) – three required or alternate measures plus three of 13 others, e.g.,
  - Hypertension – blood pressure measurement
  - Tobacco use assessment and cessation intervention
  - Adult weight screening and follow-up
- EH (inpatient) – 15 required measures, e.g.,
  - Diabetes: Hemoglobin 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

### 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 HITECH funding for the HIT infrastructure

- Regional Extension Centers (RECs)
  - \$677 million for 62 RECs that provide guidance, mainly to small primary care practices and critical access hospitals, in achieving MU
- State-based health information exchange (HIE)
  - \$547 million in grants to states to develop HIE programs
- Beacon communities
  - \$250 million to fund 17 communities that provide exemplary demonstration of MU 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
  - Based on 12 workforce roles, educated in community colleges and universities
- HITECH funded \$118 million for
  - Community college consortia (\$70M)
  - Curriculum Development Centers (\$10M)
  - Competency testing (\$6M)
  - University-based training grants (\$32M)

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## Components of the ONC HIT curriculum

1. Introduction to Health Care and Public Health in the U.S.
2. The Culture of Health Care
3. Terminology in Health Care and Public Health Settings
4. Introduction to Information and Computer Science
5. History of Health Information Technology in the U.S.
6. Health Management Information Systems
7. Working with Health IT Systems
8. Installation and Maintenance of Health IT Systems
9. Networking and Health Information Exchange
10. Fundamentals of Health Workflow Process Analysis & Redesign
11. Configuring EHRs
12. Quality Improvement
13. Public Health IT
14. Special Topics Course on Vendor-Specific Systems
15. Usability and Human Factors
16. Professionalism/Customer Service in the Health Environment
17. Working in Teams
18. Planning, Management and Leadership for Health IT
19. Introduction to Project Management
20. Training and Instructional Design

(Lab components using VA VistA EHR)

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## Program of Assistance for University-Based Training (UBT)

- Funding for education of individuals in workforce 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 run as “tuition assistance” program for existing programs
  - [www.informatics-scholarship.info](http://www.informatics-scholarship.info)

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## Telemedicine

- Delivery of healthcare where time and/or distance separate participants (Field, 2002)
- Classification of telemedicine (Hersh, 2001)
  - Store-and-forward
  - Office/hospital-based
  - Home-based
- Ongoing problem is quality of evaluation studies, which impedes coverage by insurers (Hersh, 2006; Ekeland, 2010)
- Most promising areas may be
  - Home telehealth (Darkins, 2008; Shea, 2009)
  - “Provider-to-provider” communications (Cusack, 2007; McCambridge, 2010)

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