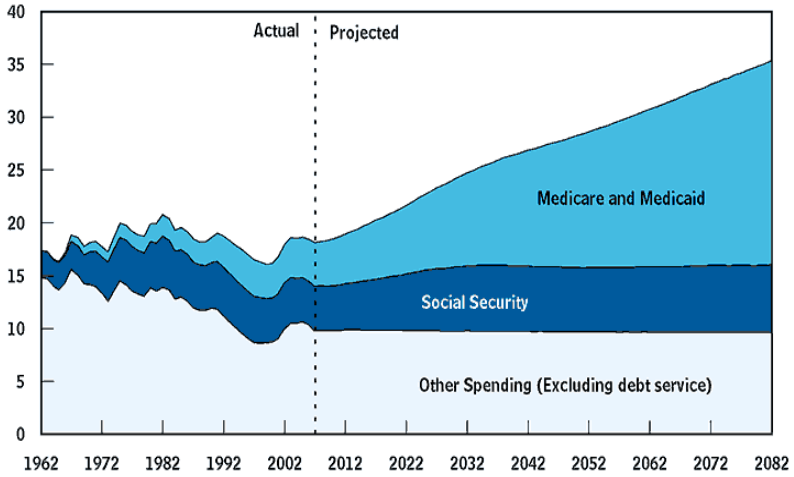
# U.S. Healthcare Problem

## U.S. Federal Spending

GDP (%)



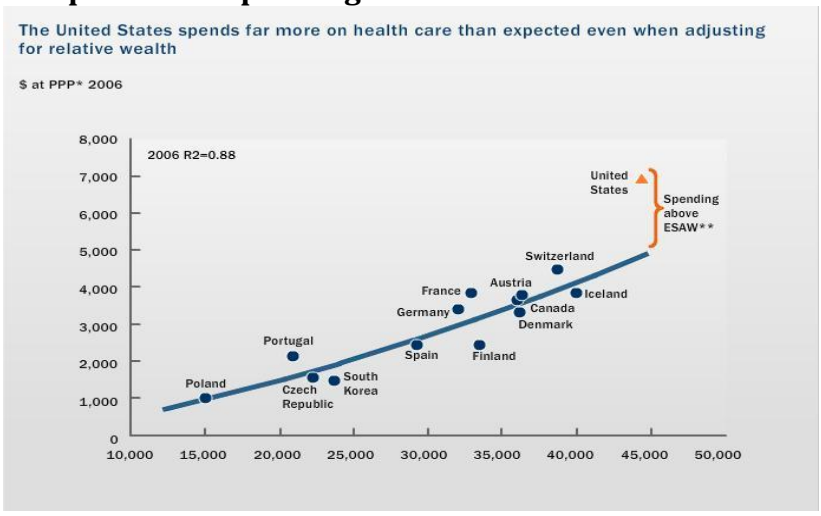

**Source**: Congressional Budget Office

This graph shows that government has to spend a lot of more money in healthcare in the future and it is growing so rapidly to cover people in U.S.

- $2.5 trillion on healthcare (2010), $14.5 trillion (GDP in 2010)
- 17.3% of GDP ($8,047 per person)

It is still high percentage of GDP money is spent for Medicare and Medicaid. (* add percentage of GDP in other countries) The one of reasons is that the average life expectancy has been extended.

## Comparison of Spending




**Source**: McKinsey & Company, December 2008

The normalization shows that U.S. spending in healthcare is much higher than other countries. As we can see above, the U.S. healthcare problem will be more critical issues in the future, and we will spend a lot of more money on health care.

# U.S. Regulation and Policy

So, one of possible solutions to solve the major problem in healthcare is HIT. Then why do we need HIT? Probably to save a lot of money from redundancy care, drug treatment, and improve quality of care.

**Key words:**
- Food and Drug Administration (FDA)
- United States Department of Health and Human Services (HSS)
- Centers for Medicare & Medicaid Services (CMS)
- Institute of Medicine (IOM)
- Regional Health Information Organizations (RHIOs)
- American Recovery and Reinvestment Act (ARRA)
- Office of National Coordinator for Health Information Technology (ONC)
- Health Information Technology for Economic and Clinical Health (HITECH) Act

**History**

2004
- Bush's Goal: "Electronic Health Record for every American by the year 2014. By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care" (State of the Union address, Jan. 20, 2004)
- ONC was created by George W. Bush as part of HHS (Dr. David Brailer was the first National Coordinator)

2009
- Barack Obama: "Computerize all health records within five years" (speech at George Mason University on Jan 12, 2009)
- ARRA is signed into law on February 17, 2009
- HITECT is a part of ARRA which provides an incentive program to stimulate the EHR adoption. (Dr. David Bluementhal appointed the new National Coordinator)

**American Recovery and Reinvestment Act of 2009**

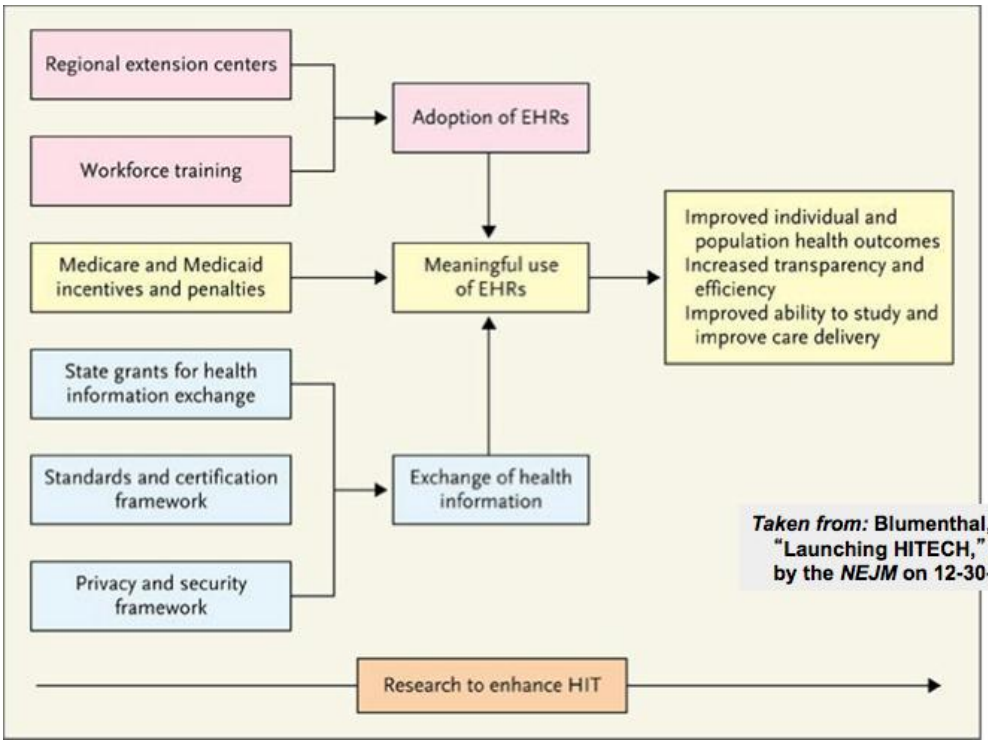
Healthcare gets $147.7 Billion out of $787 Billion
- $87 Billion for Medicaid
- $25 Billion for support for extending COBRA
- $10 Billion for NIH (National Institute of Health)
- $19 Billion for HIT (HITECH)

**Health Information Technology for Economic and Clinical Health (HITECH) Act**

New Regulation (CMS Incentives ~ $17B)
- CMS EHR Meaningful Use Incentive Program
- HHS/ONC Standards, implementation specifications & certification criteria
- Final Rule for Temporary EHR Certification Program

New Program (ONC-sponsored programs ~ $2B)
- 70 Regional Extension Centers to support small practices
- Health Information Exchange state program support
- Workforce Training Programs to support HIT education
- Beacon Communities – 15 demonstration projects of EHR value
- SHARP Research Projects – 4 HIT adoption breakthrough advances
- NHIN common platform for health information exchange
- Standards & Certification interoperability specifications

## HITECH Framework




***Taken from:*** **Blumenthal, D. "Launching HITECH," posted by the *NEJM* on 12-30-2009.**

## Incentives

### - Medicare (eligible professional)

| Payment Amounts | If a Medicare Eligible Professional Qualifies to Receive First Payment in 2011 | If a Medicare Eligible Professional Qualifies to Receive First Payment in 2012 | If a Medicare Eligible Professional Qualifies to Receive First Payment in 2013 | If a Medicare Eligible Professional Qualifies to Receive First Payment in 2014 |
|---|---|---|---|---|
| Payment Amount for 2011 Will Be | $18,000 | | | |
| Payment Amount for 2012 Will Be | $12,000 | $18,000 | | |
| Payment Amount for 2013 Will Be | $8,000 | $12,000 | $15,000 | |
| Payment Amount for 2014 Will Be | $4,000 | $8,000 | $12,000 | $12,000 |
| Payment Amount for 2015 Will Be | $2,000 | $4,000 | $8,000 | $8,000 |
| Payment Amount for 2016 Will Be | | $2,000 | $4,000 | $4,000 |
| **Total Payment Amount Will Be** | **$44,000** | **$44,000** | **$39,000** | **$24,000** |

**For 2015 and later, Medicare eligible professionals who do not successfully demonstrate meaningful use will have a payment adjustment to their Medicare reimbursement.** The payment reduction starts at 1% and increases each year that a Medicare eligible professional does not demonstrate meaningful use, to a maximum of 5%.

### - Medicare (eligible hospital)

### i) Initial Amount

Table 1: Initial Amount Calculation

| Type of Hospital | Hospitals with 1,149 or fewer discharges during the payment year | Hospitals with at least 1,150 but no more than 23,000 discharges during the payment year | Hospitals with 23,001 or more discharges during the payment year |
|---|---|---|---|
| Base Amount | $2,000,000 | $2,000,000 | $2,000,000 |
| Discharge-Related Amount | $0 | $200 x (n – 1,149) **(n is the number of discharges during the payment year)** | $200 x (23,001 – 1,149) |
| Total Initial Amount | $2,000,000 | Between $2M and $6,370,400 depending on the number of discharges | Limited by law to $6,370,400 |

**An eligible hospital is able to get incentive from $2M upto $6,370,400 per year.**

**ii) Medicare Share**

The formula for the Medicare Share calculation is as follows:

$$\frac{\#\text{ of IP Part A Bed Days} + \#\text{ of IP Part C Days}}{\text{Total IP Bed Days} \times \left[\frac{\text{Total Charges} - \text{Charges Attributable to Charity Care}}{\text{Total Charges}}\right]}$$

IP=inpatient

(detail information about the each parameters are in https://www.cms.gov/MLNProducts/downloads/EHR_TipSheet_Medicare_Hosp.pdf)

**iii) Transition Factor**

**Table 2: Fiscal Year That Eligible Hospital First Receives the Incentive Payment**

| Fiscal Year | | | | | |
|---|---|---|---|---|---|
| | **2011** | **2012** | **2013** | **2014** | **2015** |
| 2011 | 1.00 | | | | |
| 2012 | 0.75 | 1.00 | | | |
| 2013 | 0.50 | 0.75 | 1.00 | | |
| 2014 | 0.25 | 0.50 | 0.75 | 0.75 | |
| 2015 | | 0.25 | 0.50 | 0.50 | 0.50 |
| 2016 | | | 0.25 | 0.25 | 0.25 |

**This is another factor to determine the incentive payment for a payment year.**
**Starting to adopt a EHR system between 2011 and 2013 will get full amount of money.**

## *Example*

Hospital A becomes a meaningful user and is eligible for incentive payments beginning in FY 2011. Hospital A had 1,000 acute care inpatient discharges in FY 2010 (the latest filed 12-month cost report). Also, in FY 2010 it had 3,000 Part A acute care inpatient-bed-days and 4,000 Part C acute care inpatient-bed-days. Its total acute care inpatientbed-days in FY 2010 were 10,000. Hospital A's total charges excluding charity care were $2,700,000, and its total charges for the period were $3,000,000. Based on this information, Hospital A received a preliminary incentive payment of $1,560,000 for being a meaningful user of certified EHR technology in FY 2011. Its incentive payment was calculated as follows:

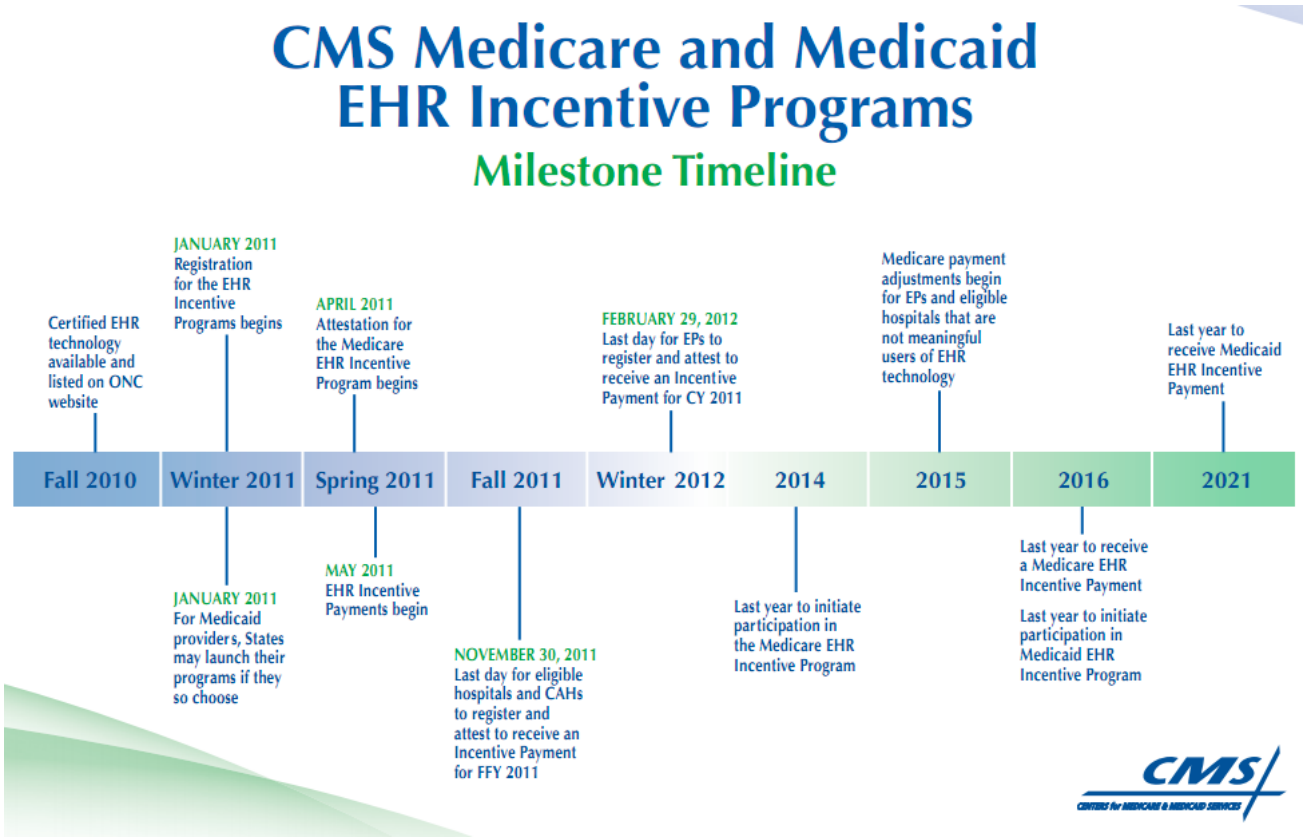
**Initial Amount – $2,000,000 (Hospital A did not have more than 1,149 discharges)**
**Medicare Share – 0.78 = ([3,000 + 4,000] divided by [10,000 x (2,700,000/3,000,000)])**
**Transition Factor – 1**
**Preliminary Incentive Payment – $2,000,000 x 0.78 x 1 = $1,560,000**

**UM Hospital Case!**
**Initial Amount – $6,370,400 (I guess UM Hospital has more than 23,001 discharges)**
**Medicare Share – 0.8 = (hard to tell for me)**
**Transition Factor – 1**
**Preliminary Incentive Payment – $6,370,400 x 0.78 x 1 = $5,096,320**
(in this case, total amount of incentive UM Hospital will receive is **$12,740,800**)

**- Medicaid (eligible professional)**
**See:** https://www.cms.gov/EHRIncentivePrograms/

**- Medicaid (eligible professional)**
**See:** https://www.cms.gov/MLNProducts/downloads/Medicaid_Hosp_Incentive_Payments_Tip_Sheets.pdf

**source:** CMS EHR Incentive Program



**Definition of an EHR**

**Box 1. Primary and Secondary Uses of an Electronic Health Record System**

| Primary Uses | Secondary Uses |
|---|---|
| • Patient Care Delivery | • Education |
| • Patient Care Management | • Regulation |
| • Patient Care Support Processes | • Research |
| • Financial and Other Administrative Processes | • Public Health and Homeland Security |
| • Patient Self-Management | • Policy Support |

SOURCE: Adapted from Institute of Medicine (1997).

**Box 2. Core Functionalities for an Electronic Health Record System**

- Health information and data
- Results management
- Order entry/management
- Decision support
- Electronic communication and connectivity
- Patient support
- Administrative processes
- Reporting & population health management

**Criteria to Select Core EHR Functionalities**

- Improve patient safety
- Support the delivery of effective patient care
- Facilitate management of chronic conditions
- Improve efficiency
- Feasibility of implementation

***Source**: IOM 2003: Key Capabilities of an Electronic Record*

## Defining EHRs: Basic and Comprehensive EHR

| | Basic | Fully Functional |
|---|---|---|
| **Health Information and Data** | | |
| Patient demographic information | ✓ | ✓ |
| Physician notes | ✓ | ✓ |
| Nursing assessment | ✓ | ✓ |
| Problem lists | ✓ | ✓ |
| Medication lists | ✓ | ✓ |
| Discharge summaries | ✓ | ✓ |
| Advanced Directives | | ✓ |
| **Order Entry Management** | | |
| Lab tests | | ✓ |
| Radiology tests | | ✓ |
| Medications | ✓ | ✓ |
| Consultation requests | | ✓ |
| Nursing orders | | ✓ |
| **Result Viewing** | | |
| Lab reports | ✓ | ✓ |
| Radiology reports | ✓ | ✓ |

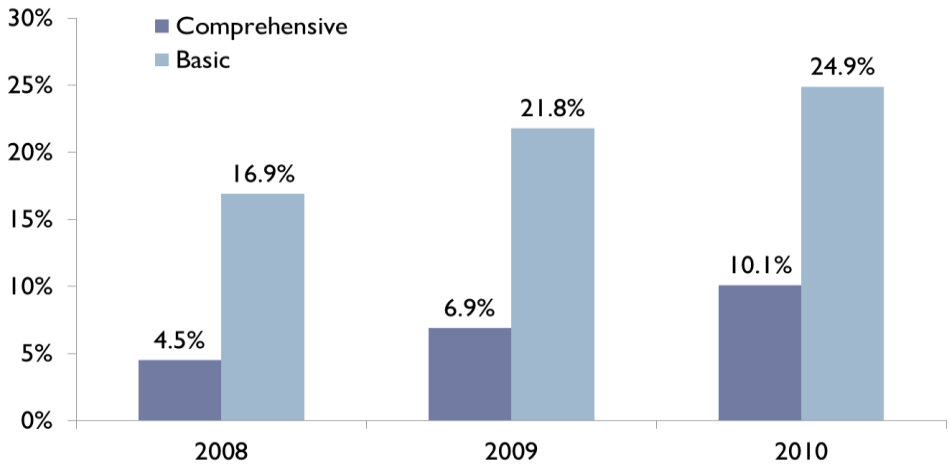
| | | |
|---|---|---|
| Radiology images | | ✓ |
| Diagnostic test results | ✓ | ✓ |
| Diagnostic test images | | ✓ |
| Consultant reports | | ✓ |
| **Decision Support** | | |
| Clinical guidelines | | ✓ |
| Clinical reminders | | ✓ |
| Drug allergy alerts | | ✓ |
| Drug-drug interaction alerts | | ✓ |
| Drug-lab interaction alerts | | ✓ |
| Drug dosing support | | ✓ |

According to the table, the University of Michigan Hospital has been setup a fully functional EHR system. Centricity has all the functions in this table, but some are not clear for me in the Decision Support section. I will keep my eyes on this section.

However, implementing all the functionality is a good way to say a hospital has a perfect EHR system? In my view, this way of defining of EHRs may be good to start to achieve the future-oriented goal, but just listing the capability of EHR function is similar to show features of a decent smart-phone to attract customers. How can you tell the efficiency and accuracy of the EHR system from the table?... It might need another way to represent these.

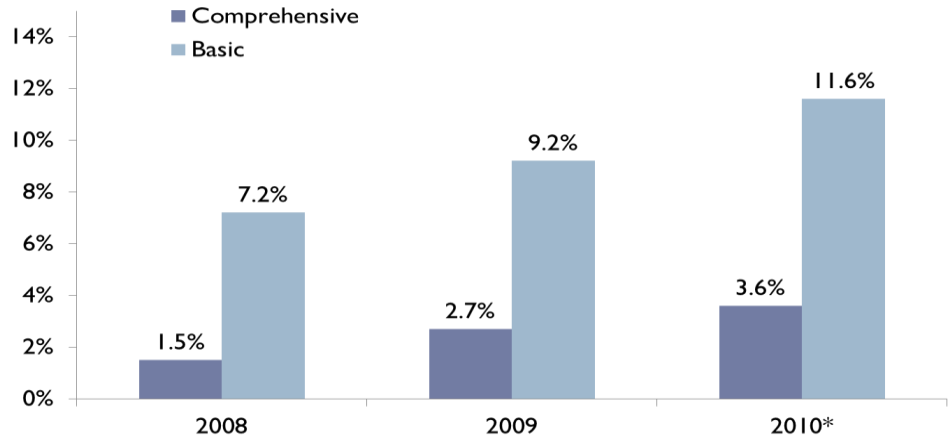
# Adoption Rate

### Ambulatory EHR Adoption




**Source**: Hsiao et al. National Ambulatory Medical Care Survey

### Hospital EHR Adoption Rates




**Source**: Jha et al, Health Affairs, 2010. *Data not yet published

Note: Why ambulatory EHR Adoption rates are higher? This is may be ambulatory care is on an outpatient basis. The outpatient is admitted and discharged within 24 hours and during in the hospital, the patient needs investigation or treatment such as blood test, x-ray, MRI etc. This treatment requires a lot of information transaction and also billing process too.

### Major barriers to EHR adoption

- Lack of capital
- Uncertainty of ROI (Return on Investment)
- Finding a system that meets your needs
- System becoming obsolete
- Capacity to implement
- Loss of productivity

**Blumenthal, D. (2010). "Launching HITECH." N Engl J Med 362(5): 382-385.**

Summary
eHIT = nationwide, interoperable, private and secure
DHHS propsed :

1) A **notice of proposed rule-making** (NPRM) describes how hospitals, physician, and other health care professionals can quality for billions of dollars of extra Medicare and Medicaid payments through **meaningful use** of EHRs
2) An **interim final regulation** describes the **standards** and **certification criteria** that those EHRs must meet for their users to collect the payments.

- Meaningful use (issued)
  Criteria established for Medicare- and Medicaid-participating providers and hospitals to receive incentives for using electronic health records (EHRs) in a meaningful manner, which includes *electronically capturing health information* in a coded format, using that information to *track key clinical conditions*, *communicating that information in order to help coordinate care*, and *initiating the reporting of clinical quality measures* and public health information.

- Certification (forthcoming)
  A defined process of ensuring the functionality, security and interoperability of EHRs that meet the standards and certification criteria required to achieve meaningful use of those records. Providers must use certified EHTs to qualify as meaningful users.

- Interim final regulation for certification criteria and standards (issued)
  An initial set of standards, implementation specifications, and certification criteria for EHRs.

HITECT ACT was structured to reward the meaningful use of qualified, certified EHRs. The HITECH makes clear that the adoption of records is not a sufficient purpose: it is the use of EHRs to achieve health and efficiency goals that matters.

The administration is trying to do:

1) Define meaningful use
2) Encourage and support the attainment of meaningful use through incentives and grant programs
3) Bolster public trust in electronic information system by ensuring their privacy and security
4) Foster continued HIT innovation.

The DHHS defined meaningful use carefully so as to further five health care goals:

1) improving the quality, safety, and efficiency of care while reducing disparities;
2) engaging patients and families in their care
3) promoting public and population health
4) improving care coordination
5) promoting the privacy and security of EHRs

The NPRM defines only stage 1:

1) focuses on collecting critical data elements in electronic form
2) sharing key information with other providers and with patients

3) reporting quality measures to the government

(the proposed evolution of meaningful use in stages 2 and 3 would emphasize rewarding providers for using EHTs to improve processes of care and outcomes)

- **Blumenthal, D. and M. Tavenner (2010). "The "Meaningful Use" Regulation for Electronic Health Records." N Engl J Med: 1006-1114**

The ***HITECH*** authorized incentive payments through Medicare and Medicaid to clinicians and hospitals when they use EHTs privately and securely to achieve specified improvements in care delivery

On June 18, 2010, the DHHS issued a rule that laid out a process for the certification of electronic health records, so that providers can be assured they are capable of meaningful use. The DHHS also has issued another regulation that lays out the standards and certification criteria that EHRs must meet in order to be certified. Realizing that privacy and security of EHRs are vital, the DDHS has been working hard to safeguard privacy and security by implementing new protections contained in the HITECH legislation.

| Summary Overview of Meaningful Use Objectives.* | |
|---|---|
| **Objective** | **Measure** |
| **Core set of objectives to be achieved by all eligible professionals, hospitals, and critical access hospitals to qualify for incentive payments** | |
| Record patient demographics (sex, race, ethnicity, date of birth, preferred language, and in the case of hospitals, date and preliminary cause in the event of death) | Over 50% of patients' demographic data recorded as structured data |
| Record vital signs and chart changes (height, weight, blood pressure, body-mass index, growth charts for children) | Over 50% of patients 2 years of age or older have height, weight, and blood pressure recorded as structured data |
| Maintain up-to-date problem list of current and active diagnoses | Over 80% of patients have at least one entry recorded as structured data |
| Maintain active medication list | Over 80% of patients have at least one entry recorded as structured data |
| Maintain active medication allergy list | Over 80% of patients have at least one entry recorded as structured data |
| Record smoking status for patients 13 years of age or older | Over 50% of patients 13 years of age or older have smoking status recorded as structured data |
| For individual professionals, provide patients with clinical summaries for each office visit; for hospitals, provide an electronic copy of hospital discharge instructions on request | Clinical summaries provided to patients for over 50% of all office visits within 3 business days; over 50% of all patients who are discharged from the inpatient department or emergency department of an eligible hospital or critical access hospital and who request an electronic copy of their discharge instructions are provided with it |
| On request, provide patients with an electronic copy of their health information (including diagnostic-test results, problem list, medication lists, medication allergies, and for hospitals, discharge summary and procedures) | Over 50% of requesting patients receive electronic copy within 3 business days |
| Generate and transmit permissible prescriptions electronically (does not apply to hospitals) | Over 40% are transmitted electronically using certified EHR technology |
| Computer provider order entry (CPOE) for medication orders | Over 30% of patients with at least one medication in their medication list have at least one medication ordered through CPOE |
| Implement drug–drug and drug–allergy interaction checks | Functionality is enabled for these checks for the entire reporting period |
| Implement capability to electronically exchange key clinical information among providers and patient-authorized entities | Perform at least one test of EHR's capacity to electronically exchange information |
| Implement one clinical decision support rule and ability to track compliance with the rule | One clinical decision support rule implemented |
| Implement systems to protect privacy and security of patient data in the EHR | Conduct or review a security risk analysis, implement security updates as necessary, and correct identified security deficiencies |
| Report clinical quality measures to CMS or states | For 2011, provide aggregate numerator and denominator through attestation; for 2012, electronically submit measures |
| **Eligible professionals, hospitals, and critical access hospitals may select any five choices from the menu set** | |
| Implement drug formulary checks | Drug formulary check system is implemented and has access to at least one internal or external drug formulary for the entire reporting period |
| Incorporate clinical laboratory test results into EHRs as structured data | Over 40% of clinical laboratory test results whose results are in positive/negative or numerical format are incorporated into EHRs as structured data |
| Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach | Generate at least one listing of patients with a specific condition |
| Use EHR technology to identify patient-specific education resources and provide those to the patient as appropriate | Over 10% of patients are provided patient-specific education resources |
| Perform medication reconciliation between care settings | Medication reconciliation is performed for over 50% of transitions of care |
| Provide summary of care record for patients referred or transitioned to another provider or setting | Summary of care record is provided for over 50% of patient transitions or referrals |
| Submit electronic immunization data to immunization registries or immunization information systems | Perform at least one test of data submission and follow-up submission (where registries can accept electronic submissions) |
| Submit electronic syndromic surveillance data to public health agencies | Perform at least one test of data submission and follow-up submission (where public health agencies can accept electronic data) |
| **Additional choices for hospitals and critical access hospitals** | |
| Record advance directives for patients 65 years of age or older | Over 50% of patients 65 years of age or older have an indication of an advance-directive status recorded |
| Submit electronic data on reportable laboratory results to public health agencies | Perform at least one test of data submission and follow-up submission (where public health agencies can accept electronic data) |
| **Additional choices for eligible professionals** | |
| Send reminders to patients (per patient preference) for preventive and follow-up care | Over 20% of patients 65 years of age or older or 5 years of age or younger are sent appropriate reminders |
| Provide patients with timely electronic access to their health information (including laboratory results, problem list, medication lists, medication allergies) | Over 10% of patients are provided electronic access to information within 4 days of its being updated in the EHR |

*This overview is meant to provide a reference tool indicating the key elements of meaningful use of health information technology. It does not provide sufficient information for providers to document and demonstrate meaningful use in order to obtain financial incentives from the Centers for Medicare and Medicaid Services (CMS). The regulations and filing requirements that must be fulfilled to qualify for the Health IT financial incentive program are detailed at www.cms.gov.

**HEALTHIT.GOV**

1. Benefit of health IT
   - EHRs reduce paper work
   - EHRs get your information accurately into the hands of people who need it.
   - EHRs help your doctors coordinate your care and protect your safety.
   - EHRs reduce unnecessary tests and procedures.
   - EHRs give you direct access to your health records.

2. Privacy, Security
   - The Health Information Portability and Accountability Act (HIPAA)
   - What information is protected by HIPAA Privacy Rule?
   (Privacy protections apply to your "*individually identifiable health information*")
      a. Information that relates to the individual's past, present, or future physical or mental health or condition; to the provision of health care to an individual; or to past, present, or future payment for the provision of health care to the individual
      b. Information that identifies the individual, or for which there is a reasonable basis to believe it can be used to identify the individual

3. Health Information Rights
   - Right to access your health information
   - Right to an accounting of disclosures of your health information
   - Right to correct or amend your health information
   - Right to file a complaint

4.

- Module 1: **CLINICAL** INFORMATICS
  - Key Issues: Policy, Adoption, Barriers to adoption, Safety, Effectiveness, Efficiency, Meaningful use, HIE , Accountable care organization
- Module 2: **CONSUMER** HEALTH INFORMATICS
  - Privacy, Security
- Module 3: **POPULATION** HEALTH INFORMATICS
  - Key Issues: Disease control,

??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ???
What is problem in U.S. Healthcare and facing problems or challenging issues?

What is side-effects?

How do we measure quality?

What is High quality care?
- Prevention
- Early diagnosis
- Effective treatment
- Avoiding harm

??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ???

**What's the Difference?**

**Electronic medical records (EMRs)** are a digital version of the paper charts in the clinician's office. An EMR contains the medical and treatment history of the patients in one practice. EMRs have advantages over paper records. For example, EMRs allow clinicians to:

- Track data over time
- Easily identify which patients are due for preventive screenings or checkups
- Check how their patients are doing on certain parameters—such as blood pressure readings or vaccinations
- Monitor and improve overall quality of care within the practice

But the information in EMRs doesn't travel easily *out* of the practice. In fact, the patient's record might even have to be printed out and delivered by mail to specialists and other members of the care team. In that regard, EMRs are not much better than a paper record.

**Electronic health records (EHRs)** do all those things—and more. EHRs focus on the total health of the patient—going beyond standard clinical data collected in the provider's office and inclusive of a broader view on a patient's care. EHRs are designed to reach out *beyond* the health organization that originally collects and compiles the information. They are built to share information with other health care providers, such as laboratories and specialists, so they contain information from *all the clinicians involved in the patient's care*. The National Alliance for Health Information Technology stated that EHR data "can be created, managed, and consulted by authorized clinicians and staff across more than one healthcare organization."

The information moves with the patient—to the specialist, the hospital, the nursing home, the next state or even across the country. In comparing the differences between record types, HIMSS Analytics stated that, "The EHR represents the ability to easily share medical information among stakeholders and to have a patient's information follow him or her through the various modalities of care engaged by that individual." EHRs are designed to be accessed by all people involved in the patients care—*including the patients themselves*. Indeed, that is an explicit expectation in the Stage 1 definition of "meaningful use" of EHRs.

And that makes all the difference. Because when information is shared in a secure way, it becomes more powerful. Health care is a team effort, and shared information supports that effort. After all, much of the value derived from the health care delivery

system results from the effective communication of information from one party to another and, ultimately, the ability of multiple parties to engage in interactive communication of information.

**Benefits of EHRs**

With fully functional EHRs, all members of the team have ready access to the latest information allowing for more coordinated, patient-centered care. With EHRs:

- The information gathered by the primary care provider tells the emergency department clinician about the patient's life threatening allergy, so that care can be adjusted appropriately, even if the patient is unconscious.
- A patient can log on to his own record and see the trend of the lab results over the last year, which can help motivate him to take his medications and keep up with the lifestyle changes that have improved the numbers.
- The lab results run last week are already in the record to tell the specialist what she needs to know without running duplicate tests.
- The clinician's notes from the patient's hospital stay can help inform the discharge instructions and follow-up care and enable the patient to move from one care setting to another more smoothly.

So, yes, the difference between "electronic medical records" and "electronic health records" is just one word. But in that word there is a world of difference.

http://www.healthit.gov/buzz-blog/electronic-health-and-medical-records/emr-vs-ehr-difference/