



## EHRs, PHRs, and Health on the Web

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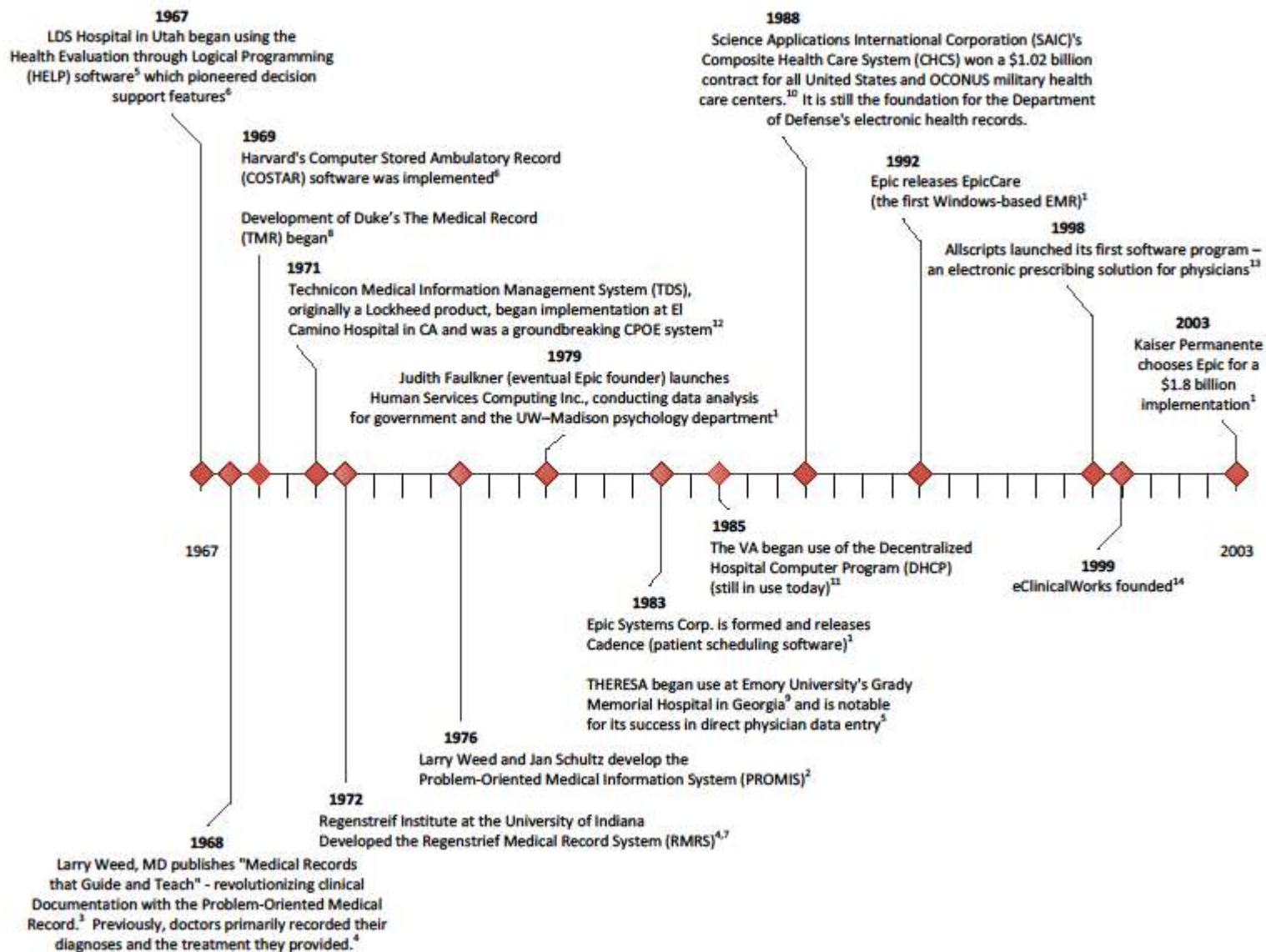


The Permanente Federation

# What's wrong with this picture?



# Timeline of EHRs



Source: Kopetsky, Matthew. "The History of Electronic Health Records." Society for Health Systems blog, <http://shsblog.org/2011/10/12/ehr/>

# ONC and the Stages of Meaningful Use



| <b>Stage 1: Data capture and sharing</b>  | <b>Stage 2: Advance clinical processes</b>                                 | <b>Stage 3: Improved outcomes</b>  |
|---|--|--|
| Electronically capturing health information in a standardized format                | More rigorous health information exchange (HIE)                            | Improving quality, safety, and efficiency, leading to improved health outcomes |
| Using that information to track key clinical conditions                             | Increased requirements for e-prescribing and incorporating lab results     | Decision support for national high-priority conditions                         |
| Communicating that information for care coordination processes                      | Electronic transmission of patient care summaries across multiple settings | Patient access to self-management tools  |
| Initiating the reporting of clinical quality measures and public health information | More patient-controlled data   | Access to comprehensive patient data through patient-centered HIE              |
| Using information to engage patients and their families in their care               |  | Improving population health  |

# Meaningful Use Certification

## Stage 1

| Core Set - all required   |  |
|---|--|
| Demographics (50%)  | e-Prescribing (40%)  |
| Vitals: BP and BMI (50%)  | CPOE (30% including a med)   |
| Problem list:<br>ICD-9-CM or SNOMED (80%)   | Drug-drug and drug-allergy interactions<br>(functionality enabled) |
| Active medication list (80%)  | Exchange critical information<br>(perform test)                    |
| Medication allergies (80%)  | Security risk analysis   |
| Smoking status (50%)  | Report clinical quality<br>(BP, BMI, Smoke, plus 3 others)         |
| Patient clinical visit summary<br>(50% in 3 days)   | Clinical decision support<br>(one rule)                            |
| Hospital discharge instructions<br>(50%)<br>- or -<br>Patient with electronic copy<br>(50% in 3 days) |  |

| Menu - 5 of 10  |
|---|
| Drug-formulary checks (one report)  |
| Structured lab results (40%)  |
| Patients by conditions (one report)   |
| Send patient-specific education (10%)   |
| Medication reconciliation (50%)   |
| Summary care record at transitions (50%)  |
| Feed immunization registries<br>(perform at least one test)                           |
| Feed syndromic surveillance<br>(perform at least one test)                            |
| Send reminders to patients for preventative and follow-up care (20% > 65yrs. < 5yrs.) |
| Patient electronic access to labs, problems, meds and allergies (10% in 4 days)       |

# Plenty of options



Ambulatory Certified EHR Products

3,481

Inpatient Certified EHR Products

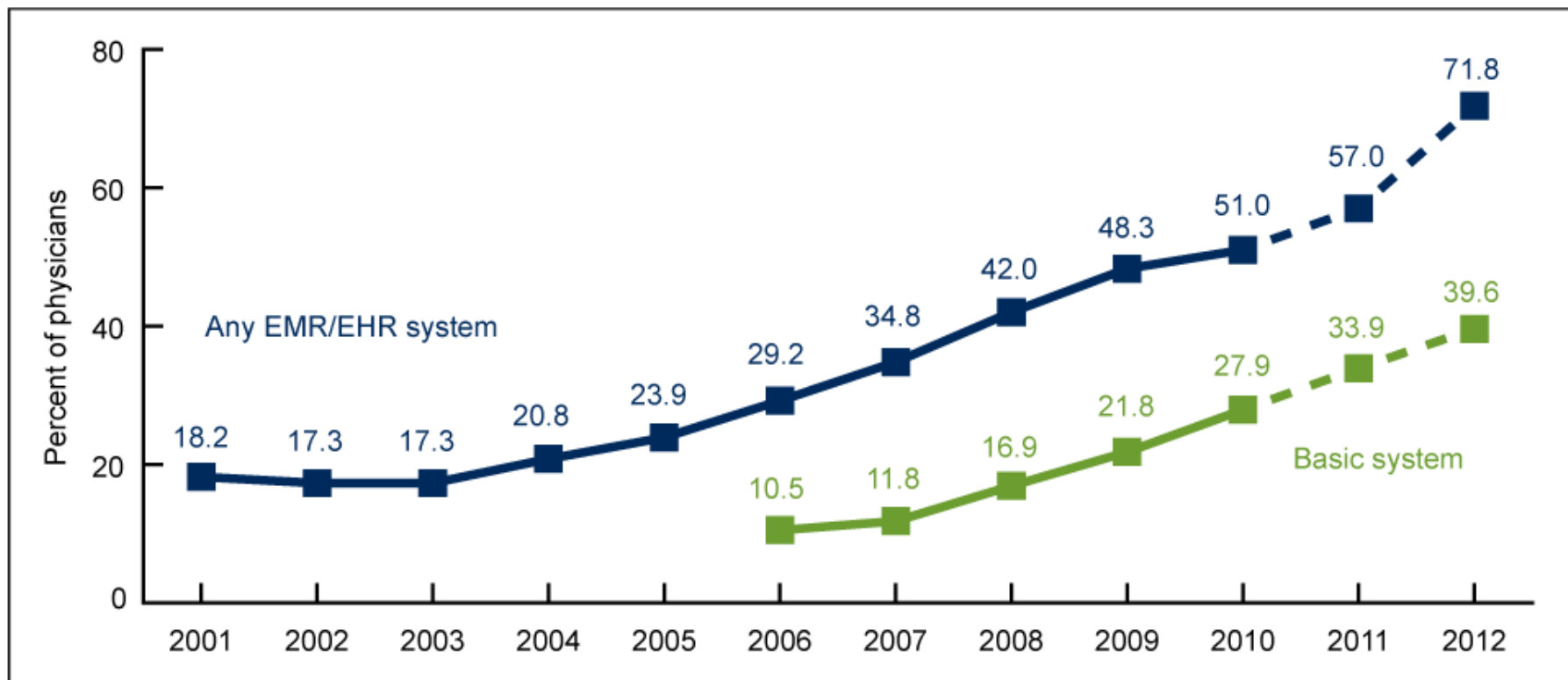
1,163

Distinct EHR Vendors

417

# So how are we doing?

Figure 1. Percentage of office-based physicians with EMR/EHR systems: United States, 2001–2010 and preliminary 2011–2012



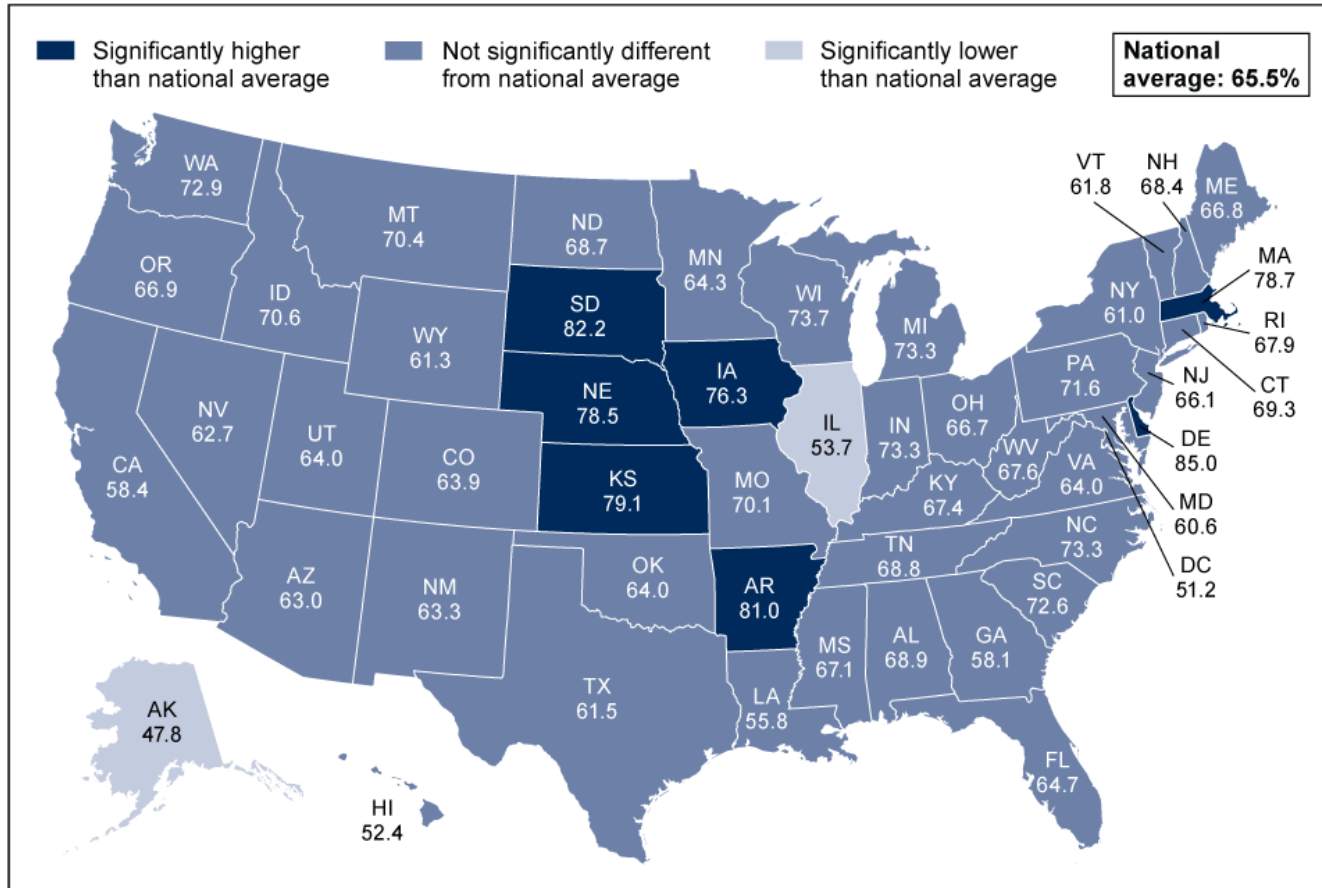
NOTES: EMR/EHR is electronic medical record/electronic health record. "Any EMR/EHR system" is a medical or health record system that is all or partially electronic (excluding systems solely for billing). Data for 2001–2007 are from in-person National Ambulatory Medical Care Survey (NAMCS) interviews. Data for 2008–2010 are from combined files (in-person NAMCS and mail survey). Data for 2011–2012 are preliminary estimates (dashed lines) based on the mail survey only. Estimates of basic systems prior to 2006 could not be computed because some items were not collected in the survey. Data include nonfederal office-based physicians and exclude radiologists, anesthesiologists, and pathologists.

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2001–2012.

Source: Hsiao CJ, Hing E. Use and Characteristics of Electronic Health Record Systems Among Office-based Physician Practices: United States, 2001-2012. NCHS data brief, no 111. Hyattsville, MD: National Center for Health Statistics. 2012

# Motivation: Meaningful Use

Figure 2. Percentage of office-based physicians intending to participate in meaningful use incentive programs, by state: United States, preliminary 2012



27%

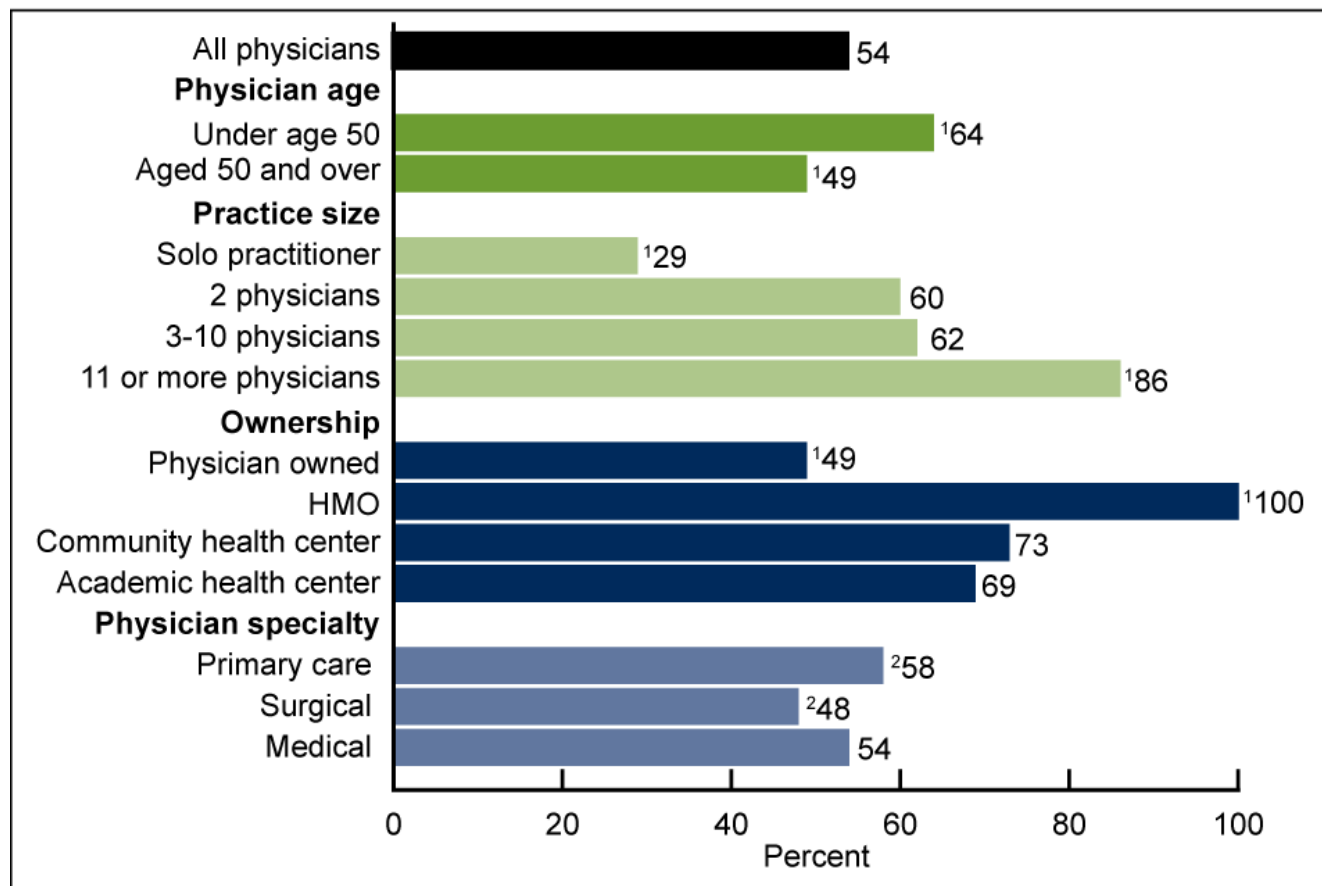
NOTES: Intent to participate in meaningful use incentive program was obtained from responses to the question, "Medicare and Medicaid offer incentives to practices that demonstrate 'meaningful use of health IT.' At this practice, are there plans to apply for these incentive payments?" Intent to participate includes "already applied" (40.5%) and "intend to apply" (25.0%). In 2012, 22.4% of physicians were uncertain about participating and 12.1% did not plan to participate. Estimates exclude missing data on the question.  
 SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2012.

Source: Hsiao CJ, Hing E. Use and Characteristics of Electronic Health Record Systems Among Office-based Physician Practices: United States, 2001-2012. NCHS data brief, no 111. Hyattsville, MD: National Center for Health Statistics. 2012



# Who does or doesn't have an EHR?

Figure 1. Percentage of electronic health record system adoption, by physician age and specialty and practice size and ownership, 2011



<sup>1</sup>Differences in adoption between this category and all others are statistically significant ( $p < 0.01$ ).

<sup>2</sup>Significant difference between primary care and surgical specialists ( $p < 0.01$ ).

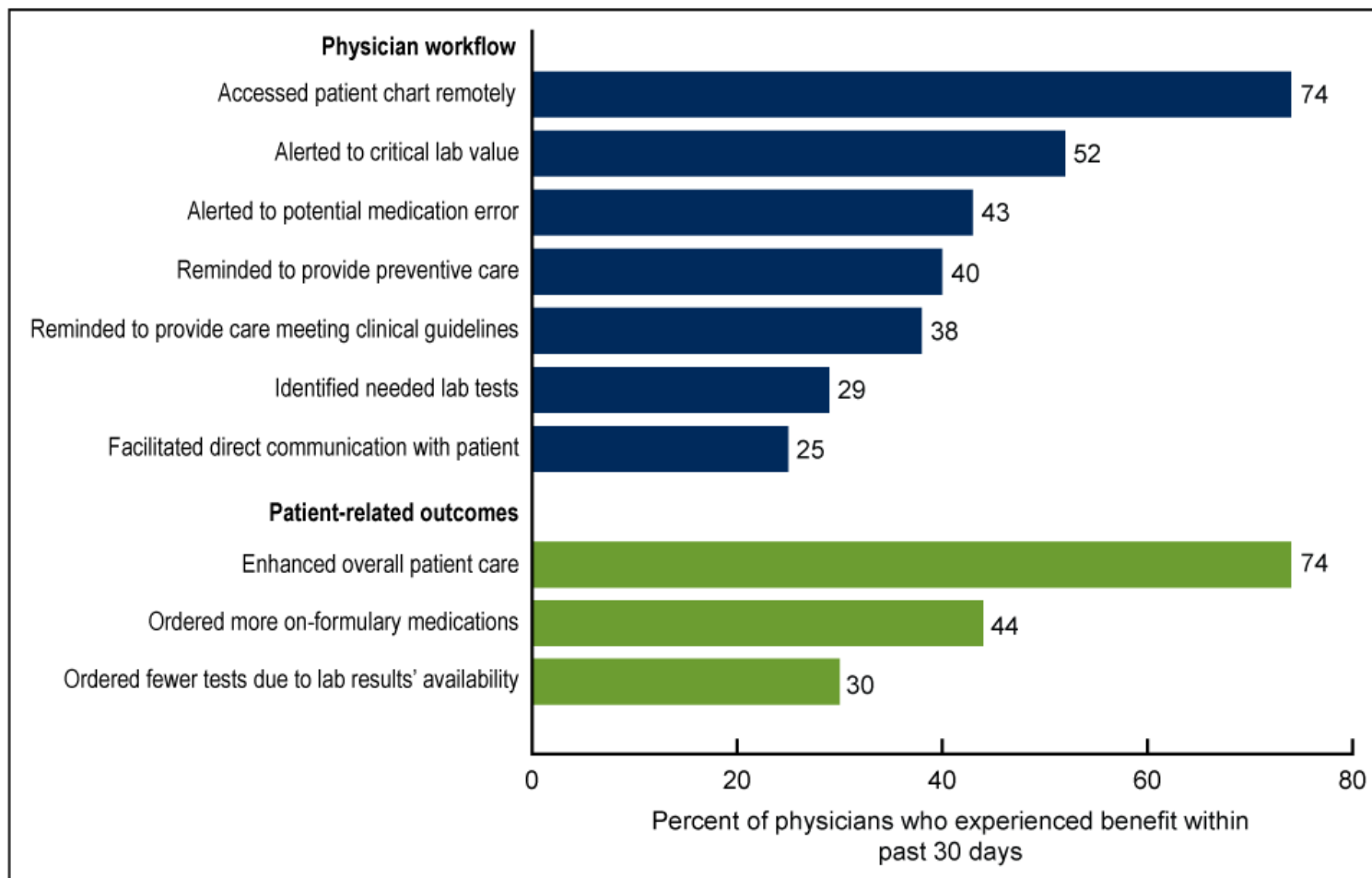
NOTES: Adoption consists of physicians who use a health record system that is all or partially electronic (excluding systems solely for billing). The sample includes nonfederal, office-based physicians and excludes radiologists, anesthesiologists, and pathologists. HMO is health maintenance organization.

SOURCE: CDC/NCHS, Physician Workflow study, 2011.

Source: Jamoom E, Beatty P, Bercovitz A, et al. Physician adoption of electronic health record systems: United States, 2011. NCHS data brief, no 98. Hyattsville, MD: National Center for Health Statistics. 2012.

# Who benefits?

Figure 4. Percentage of physicians whose electronic health records provided selected benefits: United States, 2011

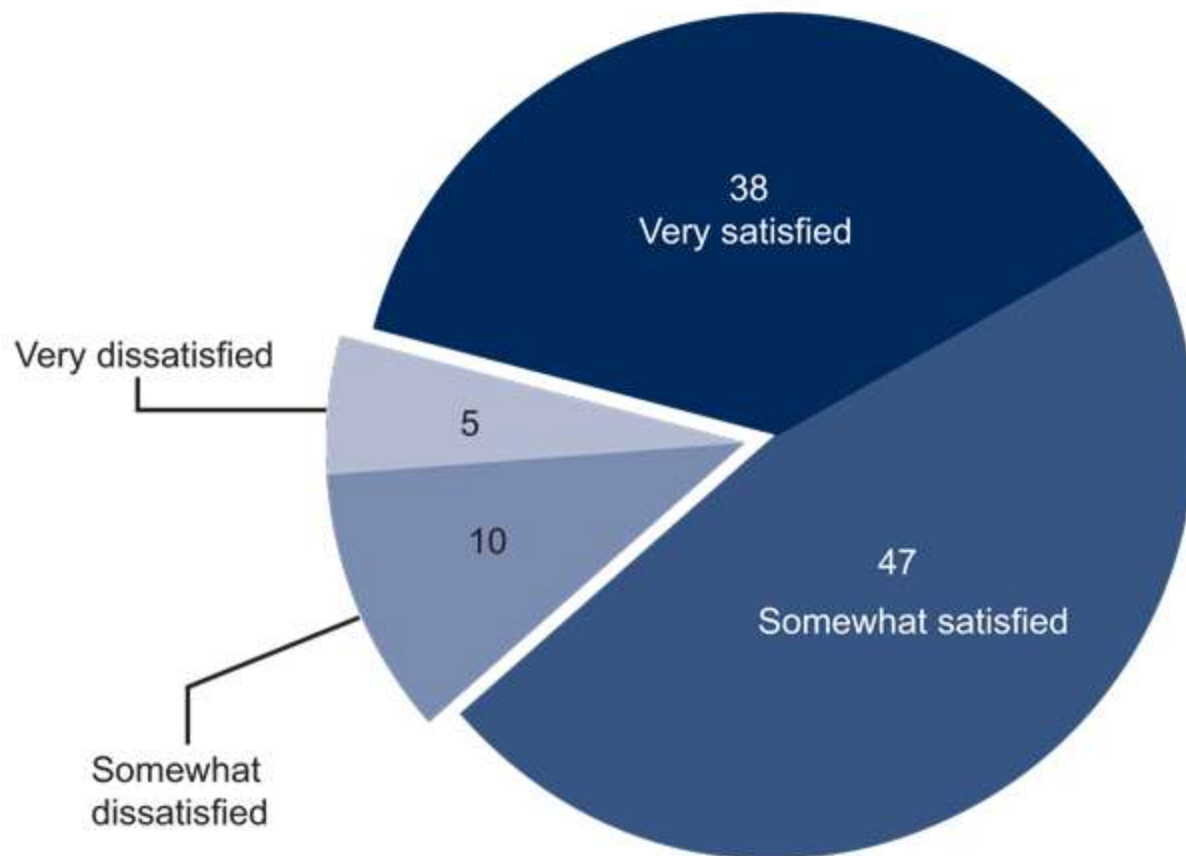


NOTES: Physicians with electronic health record (EHR) systems whose systems or scope of work did not include a specified capability responded not applicable. These responses are included in the denominator for percentages. Data represent office-based physicians who reported having adopted EHR systems (55% of sample). The sample includes nonfederal, office-based physicians and excludes radiologists, anesthesiologists, and pathologists. SOURCE: CDC/NCHS, Physician Workflow study, 2011.

Source: Jamoom E, Beatty P, Bercovitz A, et al. Physician adoption of electronic health record systems: United States, 2011. NCHS data brief, no 98. Hyattsville, MD: National Center for Health Statistics. 2012.

# Users could be happier

Figure 3. Percent distribution of electronic health record satisfaction among office-based physicians: United States, 2011



NOTES: Data represent office-based physicians who reported having adopted electronic health record systems (55% of sample). The sample includes nonfederal, office-based physicians and excludes radiologists, anesthesiologists, and pathologists. Missing values are excluded.

SOURCE: CDC/NCHS, Physician Workflow study, 2011.

Source: Jamoom E, Beatty P, Bercovitz A, et al. Physician adoption of electronic health record systems: United States, 2011. NCHS data brief, no 98. Hyattsville, MD: National Center for Health Statistics. 2012.

# The big two: The Epic environment

Atrius Health - Windows Internet Explorer  
http://wkenrmbapp01/EpicWeb/common/epic\_main.asp?menu=chartreview&sub=snapshot

**Epic** Clinicals Patient Log Out

Select an encounter: No encounter selected Close patient record

**Xbialidocious, Fuzzy\*** Age 5 yrs. Sex M DOB 1/1/06 MRN 70450825 Allergies Penicillins, Nuts, Cats, N PCP TEST PAT\* MILLER, JAMI\* LOC CAMBRIDGE MyChart On

Clinical Review Patient Snapshot

**Problem List**  Chronic

- DM (diabetes mellitus)
- bhn
- Down's syndrome
- Adjustment disorder with depressed mood
- ENROLLED - COPD PROG (NOT DX, FOR PROB LIST ONLY)
- ANTICOAGULANT LONG-TERM USE
- ANTERIOR CHAMBER IMPLANTATION CYSTS
- GENETIC SUSCEPTIBILITY TO HEMACHROMOTOSIS
- GENETIC SUSCEPTIBILITY TO HEMACHROMOTOSIS
- Family planning, emergency contraceptive counseling and prescription
- Rheumatoid arthritis
- Paronychia or onychia of finger
- Down's syndrome
- UNSPECIFIED BACKACHE - lower back
- ENROLLED - ANTICOAGULATION SVC (NOT DX, FOR PROB LIST ONLY)
- GENETIC SUSCEPTIBILITY TO HEMACHROMOTOSIS

**Health Maintenance**  Late  Due  Soon  Hold

|   |           |
|---|-----------|
| HEARING SCREENING (4 YEARS)               | Completed |
| (HEDIS) HEPATITIS B (0-18 YEARS)          | Completed |
| (HEDIS) DIPHTHERIA-TETANUS-PERTUSSIS      | Completed |
| (HEDIS) POLIOMYELITIS                     | Completed |
| (HEDIS) MEASLES/MUMPS/RUBELLA (1-5 YEARS) | Completed |
| (HEDIS) VARICELLA (1-18 YRS)              | Completed |

**Medications**  Long-Term

|   |   |
|---|---|
| Insulin NPH & Regular Human (HUMULIN 50/50) 100 unit/mL (50-50) Subcutaneous Suspension | None Entered  |
| Insulin NPH & Regular Human (HUMULIN 50/50) 100 unit/mL (50-50) Subcutaneous Suspension | test  |
| Insulin NPH & Regular Human (HUMULIN 50/50) 100 unit/mL (50-50) Subcutaneous Suspension | 1 ml  |
| Insulin Glargine (LANTUS) 100 unit/mL Subcutaneous Solution                             | 1 vial  |
| Fluocinolone 0.025 % Topical Cream  | 15 tubes  |
| Clonazepam (KLONOPIN) 0.125 mg Oral Tablet, Rapid Dissolve                              | testing refreshable                                       |
| Cetirizine (ZYRTEC) 1 mg/mL Oral Solution   | testing   |
| Acetaminophen (CHILDREN'S TYLENOL MELTAWAYS) 80 mg Oral Tablet, Rapid Dissolve          | prn for pain  |
| Bupropion HCl 300 mg Oral Tablet Sustained Release 24 hr                                | testing DO NOT FILL                                       |
| Bupropion HCl XL 300 mg Oral Tablet Sustained Release 24 hr                             | TESTING DO NOT FILL - XL Designation                      |
| Lisinopril 40 mg Oral Tablet  | Take 1 tablet daily                                       |
| Lorazepam 0.5 mg Oral Tablet  | testing only do not fill                                  |
| Fluoxetine (PROZAC) 10 mg Oral Capsule  | 1 capsule daily; do not stop without consulting clinician |
| Lisinopril 20 mg Oral Tablet  | perry, c  |
| Simvastatin 10 mg Oral Tablet   | Take 1 tablet every evening for cholesterol               |
| Albuterol Sulfate (PROAIR HFA) 90 mcg/Actuation Inhalation HFA Aerosol Inhaler          | Take 1-2 puffs every 4 to 6 hours as needed               |
| Epinephrine (EPIPEN) 0.3 mg/0.3 mL Intramuscular Pen                                    | Epipen is chosen not twin                                 |

**Patient Lists** [Top]

- ASTHMA BTRPEDS [552]
- TEST [1818]
- TEST [1183]
- TEST [3841]
- TEST [92]

# The big two: Cerner

**JOCKEY, FRED A**  
 Allergies: No Known Allergies

93y M DOB: 12/15/1918 MRN: 78396885 PCP-  
 Visit: 1/17/2011 3:53 PM | START ePrescribe | FIN: 315055915 | Out...  
 WI 1906 (05/15/12) | Ht: 67in | Bmi: 29.75 | Tobacco: Not recorded | Problems(4): obese 278.00, Hld hypertension 4...  
 Home: (405) 855-3055 | 245 KENTUCKY BLUEGRASS LANE OK... | Adv De: Yes | IQHealth: No

Summary

Overview Demographics Chart Search Community View

### Ambulatory Summary

This page is not a complete source of visit information.

Expand All Customize Help

#### Summary

**JOCKEY, FRED A** 93y M DOB: 12/15/1918  
 Visit: 01/17/2011 START ePrescribe  
 Notes: 1 | Orders: 0 | Charges: 0 | Rx: 0

- Education (0)
- Visit Summary (Depart) (Not documented)
- Reconciliation (Completed)

Chief Complaint: follow up | dm follow up | sore throat  
 Visit Provider: Cicero, Shane  
 Resp Provider: Cicero, Shane  
 PCP: --  
 Adv Dir: Yes

- Alerts (0)
- Reminders (0 overdue | 0 due | 0 future)
- Sticky Notes (0)
- Future Appointments (0)
- Past 5 Visits (0)
- Address and Phone
- Health Plans (0)

#### Medications (4)

All Visits

- Hc: Keflex, po 0 refills
- Hc: lisinopril 10 mg oral tablet, 10 mg q1 tab(s), PO, daily 90 tab(s) 0 refills
- Hc: metformin 500 mg oral tablet, 500 mg 1 tab(s), PO, bid 180 tab(s) 0 refills
- Hc: Synthroid 100 mcg (0.1 mg) oral tablet, 100 mcg 1 tab(s), PO, daily 90

#### Vitals

Last 2 years for all visits

|                   | Today within    | Previous within | 120/80          |
|-------------------|-----------------|-----------------|-----------------|
| BP                | 120/80<br>3 hrs | 120/80<br>5 wks | 120/80<br>3 mos |
| Temp              | 98<br>3 hrs     | 98<br>5 wks     | 101<br>3 mos    |
| HR                | 77<br>3 hrs     | 77<br>5 wks     | 67<br>3 mos     |
| Respiratory Rate  | 19<br>3 hrs     | 18<br>5 wks     | 18<br>3 mos     |
| Oxygen Saturation | 99<br>3 hrs     | 99<br>5 wks     | 99<br>3 mos     |

#### Measurements (3)

Last 2 years for all visits

|                 | Today within                     | Previous within                  | Change                  |
|-----------------|----------------------------------|----------------------------------|-------------------------|
| Height          | 67 in<br>3 hrs                   | 67 in<br>5 wks                   | 0 in                    |
| Weight          | 190 lb<br>3 hrs                  | 195 lb<br>5 wks                  | -5 lb                   |
| Body Mass Index | 29.75 kg/m <sup>2</sup><br>3 hrs | 30.54 kg/m <sup>2</sup><br>5 wks | -0.79 kg/m <sup>2</sup> |

#### Labs

Last 1 years for all visits

#### Documents | Notes (7)

Last 2 years for all visits

|                                 | Author                                 | Date/Time      |
|---------------------------------|--|----------------|
| Assessment Form                 | zztesto'Brien, Patrick (Do Not Use)    | 05/16/12 12:58 |
| Advance Directive Forms         | zztesto'Brien, Patrick (Do Not Use)    | 05/16/12 12:57 |
| Assessment Form                 | ZZEMR Provider Access, Provider Access | 05/16/12 10:43 |
| General Clinic Note (Physician) | ZZEMR Provider Access, Provider Access | 05/16/12 10:40 |
| Assessment Form                 | ZZEMR Provider Access, Provider Access | 05/16/12 10:39 |
| Assessment Form                 | ZZEMR Provider Access, Provider Access | 04/16/12 10:38 |
| Assessment Form                 | ZZEMR Provider Access, Provider Access | 03/12/12 10:37 |

#### Recommendations (0 Overdue | 10 Due)

All Visits

| Expiration                      | Next Due |
|---------------------------------|----------|
| Depression Screen               | 05/16/12 |
| HIV Screen (if sexually active) | 05/15/12 |

# Different approach: Hello Health

Welcome to Hello Health 4.1

hellohealth PANEL TEAM 3 MESSAGES 0 REQUESTS 0 ERX ADMIN **REPORTS** HELP LOG OUT

CQM Report MU Report

## Meaningful Use Report

Start date:  End date:  **GENERATE**

|   | Performance | Numerator | Denominator | Exclusion | Not covered |
|---|-------------|-----------|-------------|-----------|-------------|
| <b>Core Measures</b>  |             |           |             |           |             |
| <b>NQF 0421. Adult Weight Screening and Follow-Up</b>   |             |           |             |           |             |
| 65 years old and over   | 78%         | 300       | 387         | 46        | 87          |
| Between 18 and 64 years old   | 64%         | 254       | 397         | 46        | 143         |
| <b>NQF 0013. Hypertension: Blood Pressure Measurement</b>   |             |           |             |           |             |
|   | 38%         | 125       | 325         | 12        | 200         |
| <b>NQF 0028. Preventive Care and Screening Measure Pair: a. Tobacco Use Assessment, b. Tobacco Cessation Intervention</b> |             |           |             |           |             |
| a. Tobacco Use Assessment   | 78%         | 300       | 387         | 46        | 87          |
| b. Tobacco Cessation Intervention   | 64%         | 254       | 397         | 46        | 143         |
| <b>Alternate Core Measures</b>  |             |           |             |           |             |
| <b>NQF 0041. Preventive Care and Screening: Influenza Immuni for Patients &gt;= 50 Years Old</b>                          |             |           |             |           |             |
|   | 50%         | 100       | 200         | 100       | 100         |
| <b>NQF 0024. Weight Assessment and Counseling for Children Adolescents</b>  |             |           |             |           |             |
| emergency department (0021 or 20) have demographics recorded as structured data   |             |           |             |           |             |

# PHRs: Google Health

samsample@gmail.com | [Feedback](#) | [Settings](#) | [Help](#) | [Sign out](#)

 Search the web

Sam

Profile summary

[Notices](#)

[Drug interactions](#)

[Profile details](#)

[Age, sex, height...](#)

[Conditions](#)

[Medications](#)

[Allergies](#)

[Procedures](#)

[Test results](#)

[Immunizations](#)

[Add to this profile](#)

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[Online health tools](#)

[Medical contacts](#)

[Find a doctor](#)

[Create a new profile](#)



[Add to this Google Health profile](#)

Learn about your health issues and find helpful resources



[Import medical records](#)

Copy and get automatic updates of your records



[Discover more health tools](#)

Find online tools for managing your health



[Find a doctor](#)

Search by name, location, and specialty

## Profile updates

This profile is now linked with:  
**Cleveland Clinic MyConsult**



[Request an appointment](#)

[Log in to your Cleveland Clinic account](#)

[Find a Cleveland Clinic Physician](#)

## Conditions

Type 2 Diabetes [Reference](#)

High blood pressure [Reference](#)

Hyperthyroidism [Reference](#)

Low Back Pain

Migraine headaches [Reference](#)

## Medications

Amoxicillin

Lisinopril

Glyburide

Metformin

Ibuprofen

## Allergies

Penicillins - Severe

## Procedures

Appendectomy

# PHRs: Microsoft HealthVault

Microsoft  
HealthVault

Microsoft

[Your account](#) | [Sign out](#) | [Help](#)

SJ



Edit

Switch person

## SJ Hennessey

I want to ▼

40 years old

Allergies +

There are no allergies listed for you.

Current conditions +

There are no conditions listed for you.

Current medications +

There are no current medications listed for you.

Emergency contacts +

There are no contacts listed for you.

[See all of your health information](#)

Weight +

LAST 90 DAYS



Blood pressure +

LAST 6 MONTHS



Health views

[Emergency profile](#)

[Weight management](#)



Home



Health  
information



Apps &  
Devices

### UPDATES

WEDNESDAY, NOVEMBER 28, 2007

Basic Demographic Information  
Updated by you.

### SJ'S APPS

You don't have any apps yet.

Apps can help you get more out of—  
and put more into—your HealthVault



# HIPAA: The Privacy Rule

## Protected Health Information

Privacy Rule protects all "individually identifiable health information" held or transmitted by a covered entity or its business associate, in any form or media, whether electronic, paper, or oral. The Privacy Rule calls this information "protected health information (PHI)."

"Individually identifiable health information" is information, including demographic data, that relates to:

- the individual's past, present or future physical or mental health or condition,
- the provision of health care to the individual, or
- the past, present, or future payment for the provision of health care to the individual,

and that identifies the individual or for which there is a reasonable basis to believe it can be used to identify the individual.<sup>13</sup> Individually identifiable health information includes many common identifiers (e.g., name, address, birth date, Social Security Number).

## De-Identified Health Information

There are no restrictions on the use or disclosure of de-identified health information. De-identified health information neither identifies nor provides a reasonable basis to identify an individual. There are two ways to de-identify information; either:

- (1) a formal determination by a qualified statistician; or
- (2) the removal of specified identifiers of the individual and of the individual's relatives, household members, and employers is required, and is adequate only if the covered entity has no actual knowledge that the remaining information could be used to identify the individual

Source: US Department of Health and Human Services.

<http://www.hhs.gov/ocr/privacy/hipaa/understanding/summary/index.html>

# HIPAA in the age of Health Apps

