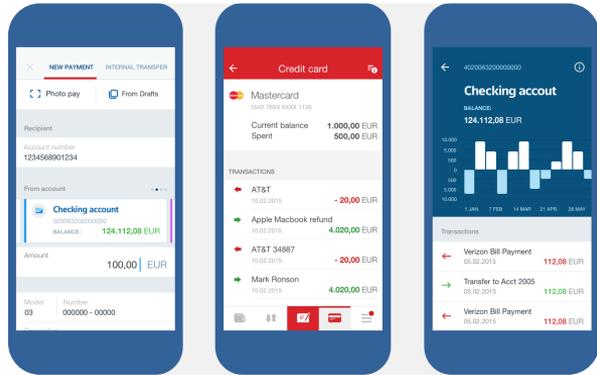


# *Communicating Data to Patients through Health Information Technology:*

*Bradford W. Hesse*

*Chief, Health Communication & Informatics Research*

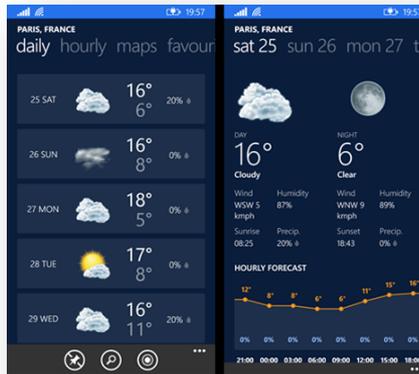
# Excerpts from 21<sup>st</sup> Century Life



Mobile Banking



Daily Weather Apps



Global Positioning

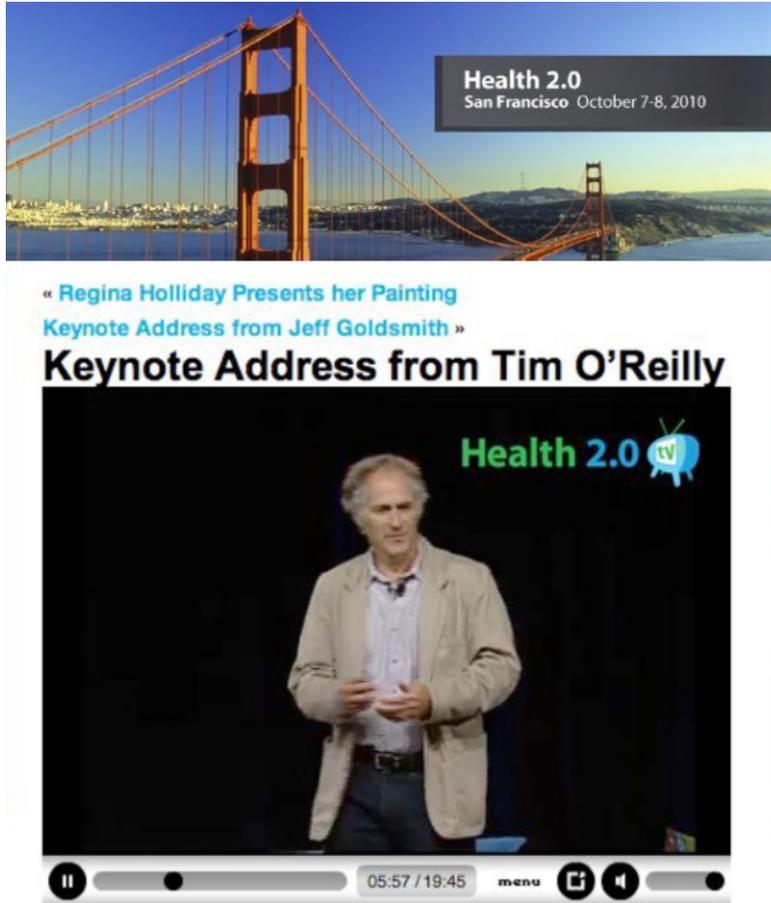
Mobile Banking



# Common Themes

- ✓ All are presentations of data.
- ✓ All represent windows on dynamic networks of trusted data exchange.
- ✓ Applications have been designed to communicate quickly, efficiently, and effectively.
- ✓ Interfaces have been engineered to prevent error & augment human capabilities.
- ✓ Apps adhere to rules for *universal design*; that is, they are usable across populations.

# Characteristics of Medicine / Health 2.0

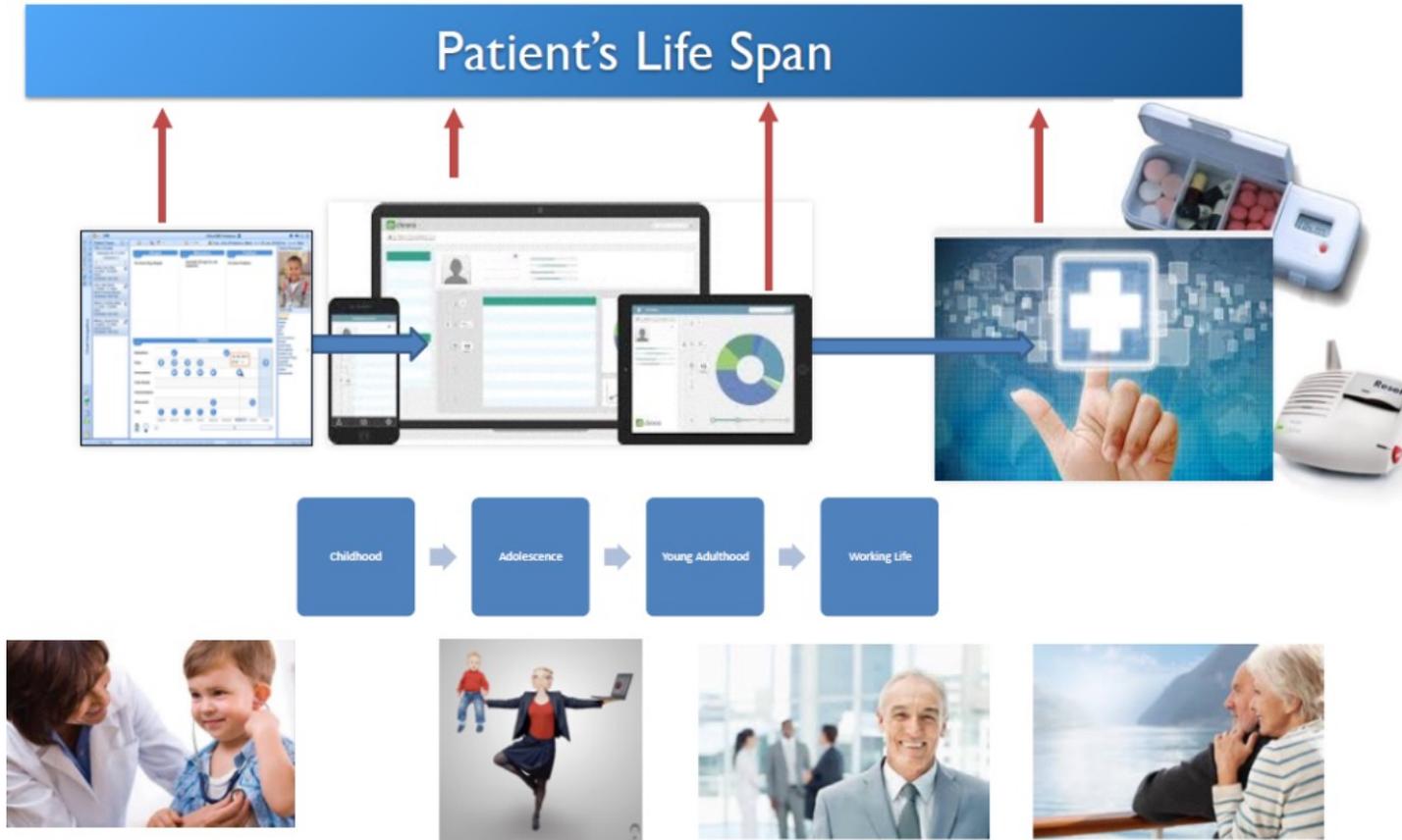


The image is a screenshot of a video player. At the top, there is a banner for the "Health 2.0" conference in San Francisco, held on October 7-8, 2010, with a background image of the Golden Gate Bridge. Below the banner, the video title reads: "« Regina Holliday Presents her Painting Keynote Address from Jeff Goldsmith » Keynote Address from Tim O'Reilly". The video frame shows Tim O'Reilly speaking on a stage. A "Health 2.0" logo is visible in the top right corner of the video frame. At the bottom of the video player, there is a progress bar showing 05:57 / 19:45, a "menu" button, and volume controls.

- New platforms will encourage participation / engagement
- Emphasis will be on situational awareness & “collective intelligence”
- Data will be the new “Intel Inside”



# Health IT: Platforms for Evidence Implementation



**Source:** Abernethy, A. P., & Hesse, B. W. (2011). Information Technology and Evidence Implementation. *Translational Behavioral Medicine*, 1(1), 11-14.

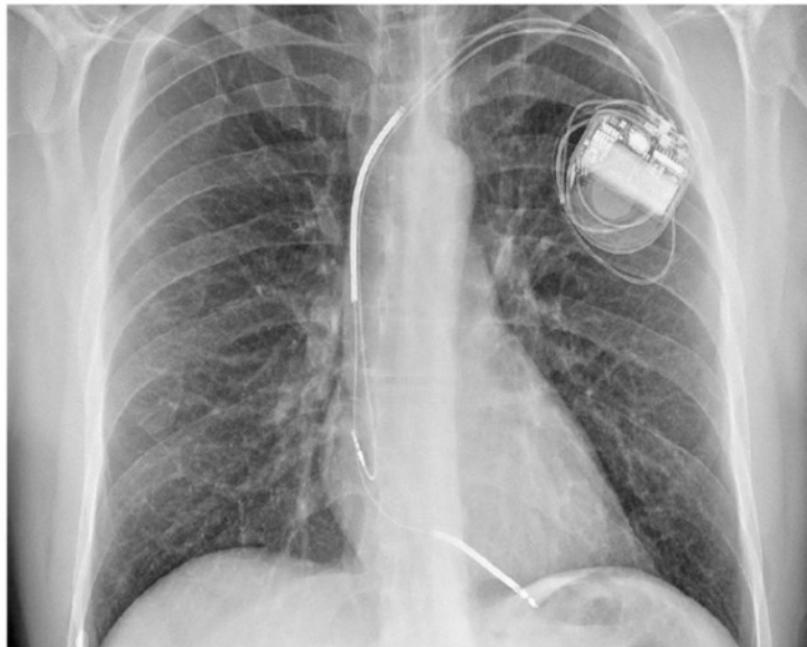


So, how are we  
doing?

# The Case of Hugo Campos

Hugo's digital implanted defibrillator

Putting the I in HealthIT   
[www.HealthIT.gov](http://www.HealthIT.gov)



5/3/2012

Office of the National Coordinator for  
Health Information Technology

19

# The Case of Hugo Campos

His doctor's data experience

Putting the I in HealthIT  
www.HealthIT.gov

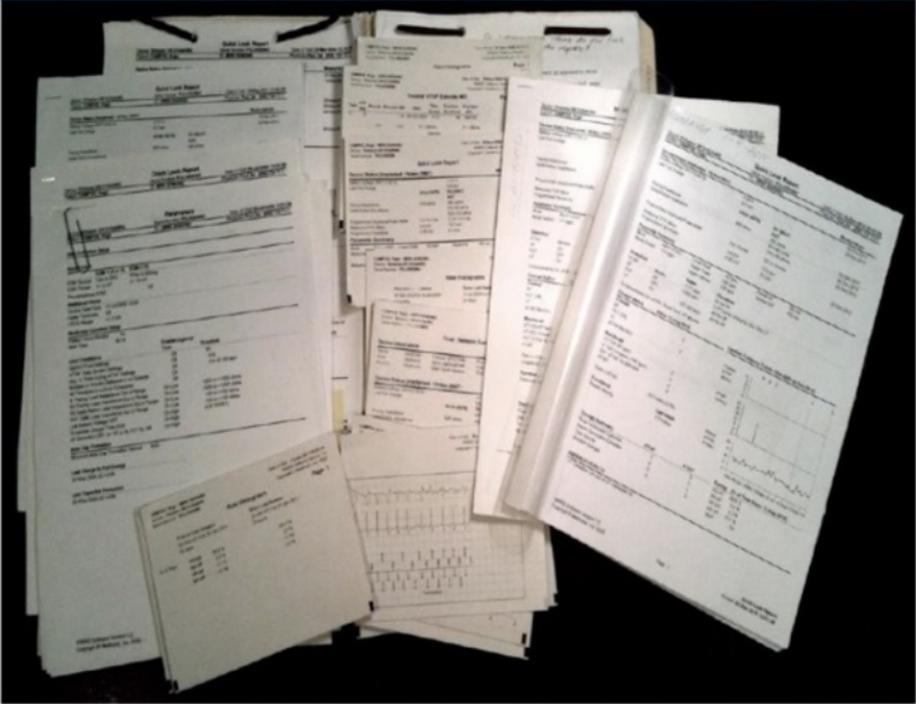


Full,  
unrestricted  
& convenient  
access.

# The Case of Hugo Campos

Hugo's experience  
(6-12 months later)

Putting the I in Health IT   
[www.HealthIT.gov](http://www.HealthIT.gov)



5/3/2012

Office of the National Coordinator for  
Health Information Technology

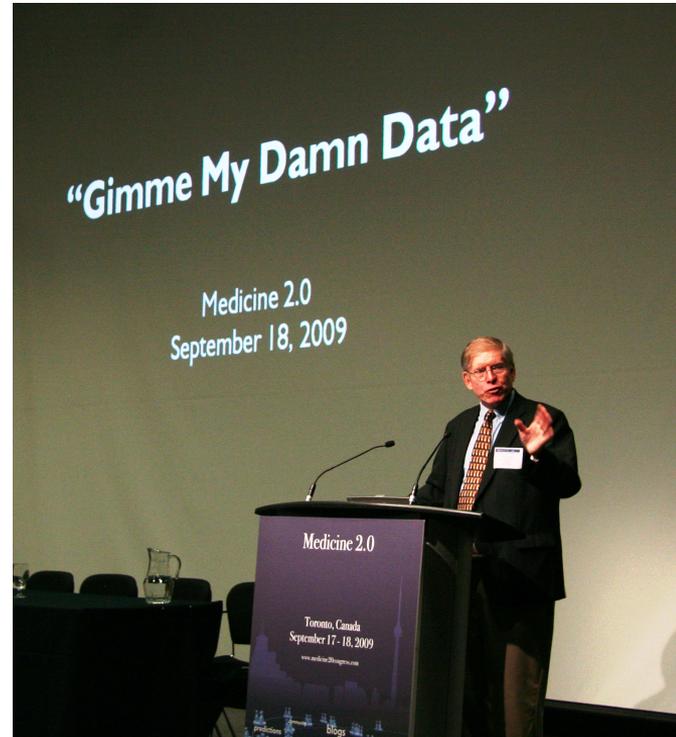
21

# Health Data Access Declared a Legal Right

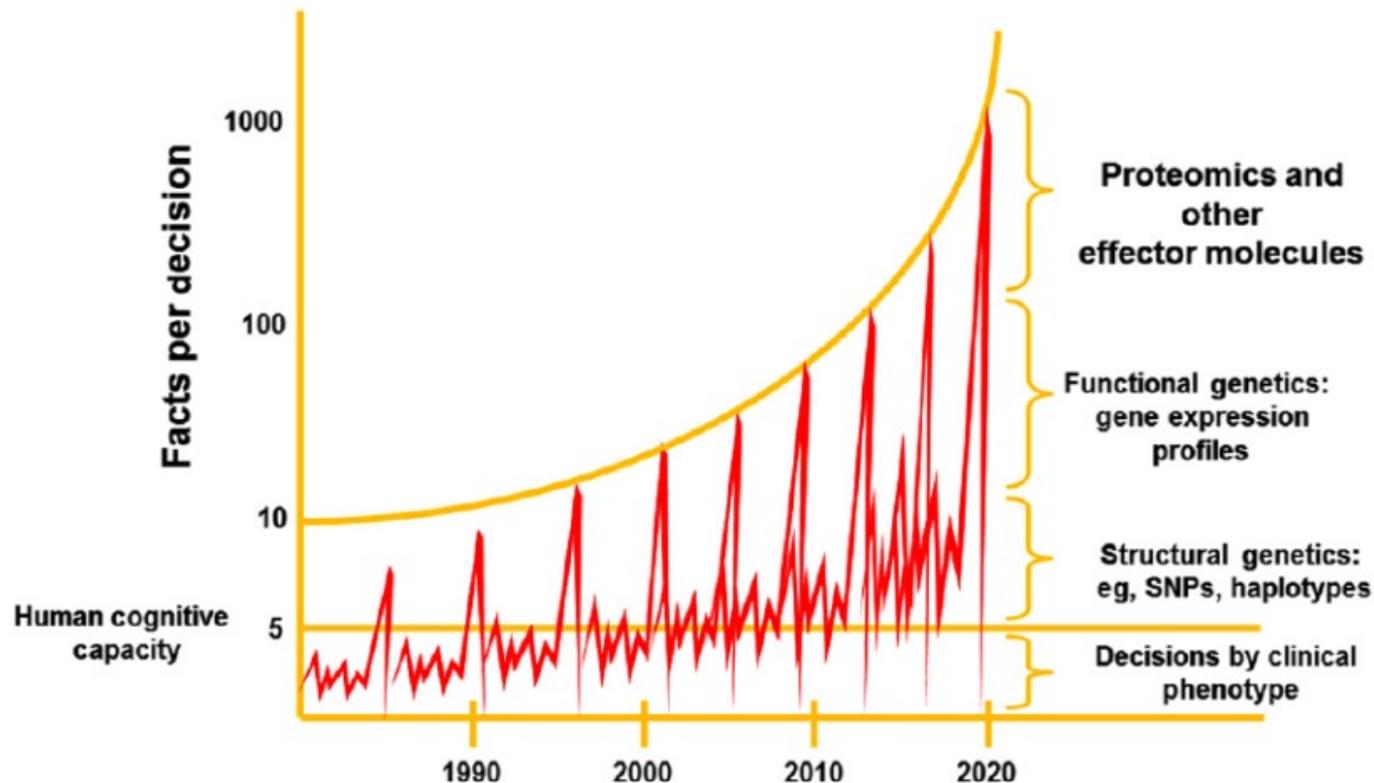
## Improving the Health Records Request Process for Patients

Insights from User Experience Research

The Office of the National Coordinator for Health Information Technology



# Data Deluge: Quickly stripping cognitive capacity of clinical teams and patients.



**Source:** Hesse, B. W., Ahern, D. K., & Beckjord, E. (Eds.). (2016). *Oncology Informatics: Using Health Information Technology to Improve Processes and Outcomes in Cancer*. Boston, MA: Elsevier.

# “Baton Dropping:” Communication is More than Presentation



## Root Cause Information for Delay in Treatment Events Reviewed by The Joint Commission

(Resulting in death or permanent loss of function)

2004 through 2014 (N=971) <i>The majority of events have multiple root causes</i>	
Communication	787
Assessment	753
Human Factors	701
Leadership	662
Information Management	279
Continuum of Care	253
Care Planning	170
Physical Environment	147
Medication Use	74
Patient Rights	27

- ❑ Total number of *preventable* medical errors from all sources exceeds 17 million each year
- ❑ Joint Commission’s *Sentinel Database* reports 70% of all reported events had communication as root cause

# Worst Communication is the One that Never Happened





# Opportunities

# 21<sup>st</sup> Century Cures Act: \$4.8 Billion over 10 Years



The 21st Century Cures Act (Cures Act), signed into law on December 13, 2016, is designed to help accelerate medical product development and bring new innovations and advances to patients who need them faster and more efficiently.

# 21<sup>st</sup> Century Cures: Putting Patients in the Center of Data

- **Trusted Exchange Network**
- **API without Special Effort**



**Health IT Buzz**  
The Latest on Health Information Technology from ONC

EHR/EMR    Health Innovation    From the ONC Desk    ONC Programs

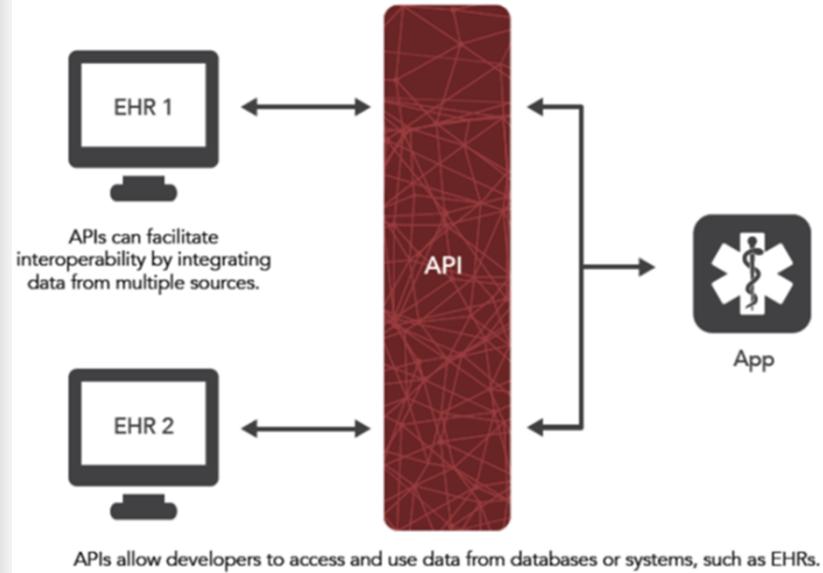
Health IT Buzz > Interoperability > APIs: A Path to Putting Patients at the Center

## APIs: A Path to Putting Patients at the Center

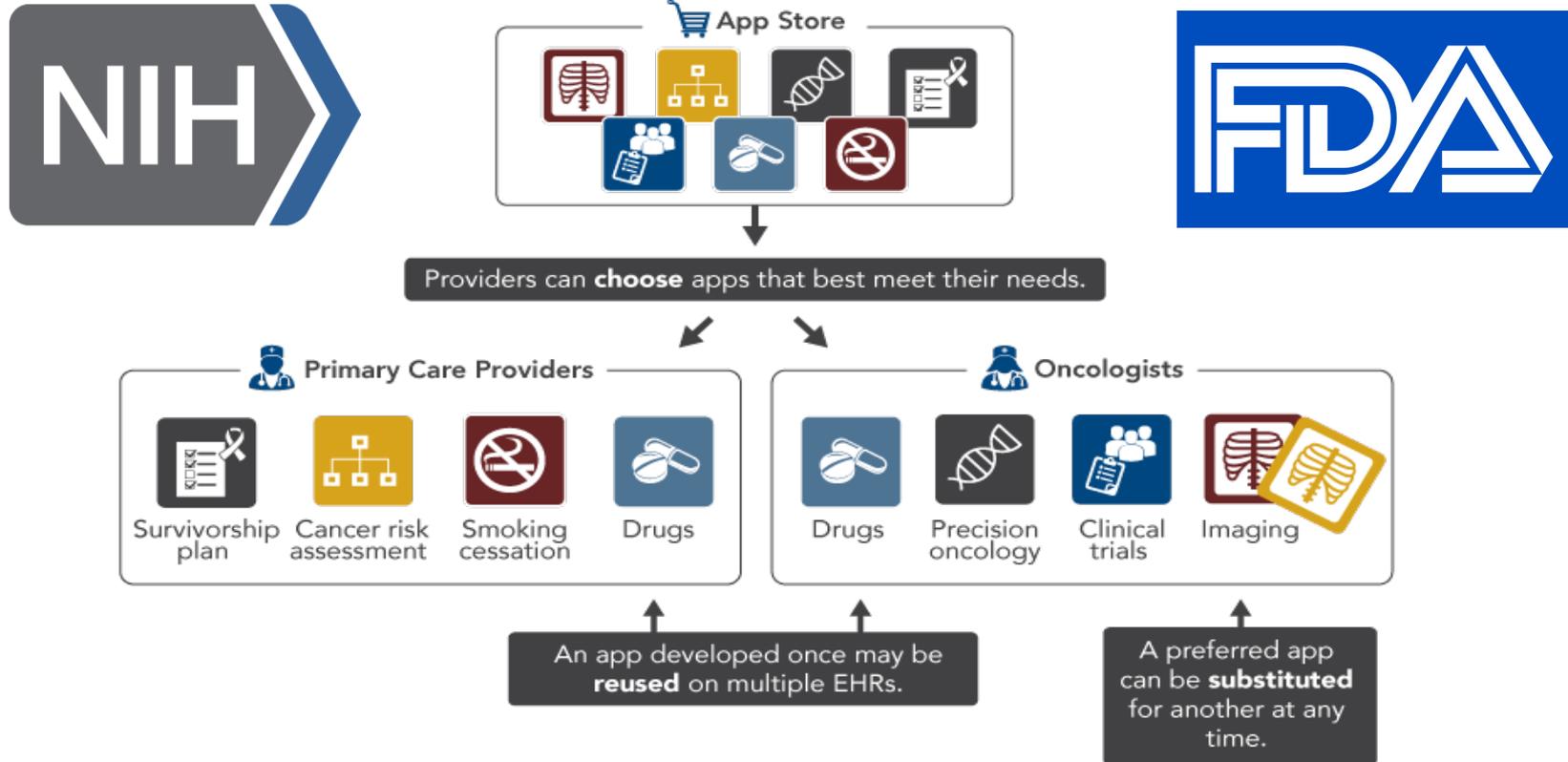
April 24, 2018, 8:42 am / Don Rucker M.D. / National Coordinator for Health Information Technology

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I remember when visiting a city required paper maps and often actual guidebooks. Today, I tap on a map app on my phone, enter my destination, and review options for getting from point A to point B. In recent years, these applications have expanded to integrate ride-sharing, bike-sharing, and public transit information. Map apps provide two key real-time data points to help me compare the different options: the time it will take to get to my destination and the cost.



# Creating an Ecosystem for Communication



**Source:** Mandl, K. D., & Kohane, I. S. (2016). Time for a Patient-Driven Health Information Economy? *N Engl J Med*, 374(3), 205-208.

# How Apple's Health Records could reshape patient engagement

Dignity Health's chief digital officer explains why he thinks Apple can succeed for population health and precision medicine efforts where other PHR launches have not.

By [Mike Miliard](#) | April 18, 2018 | 09:46 AM



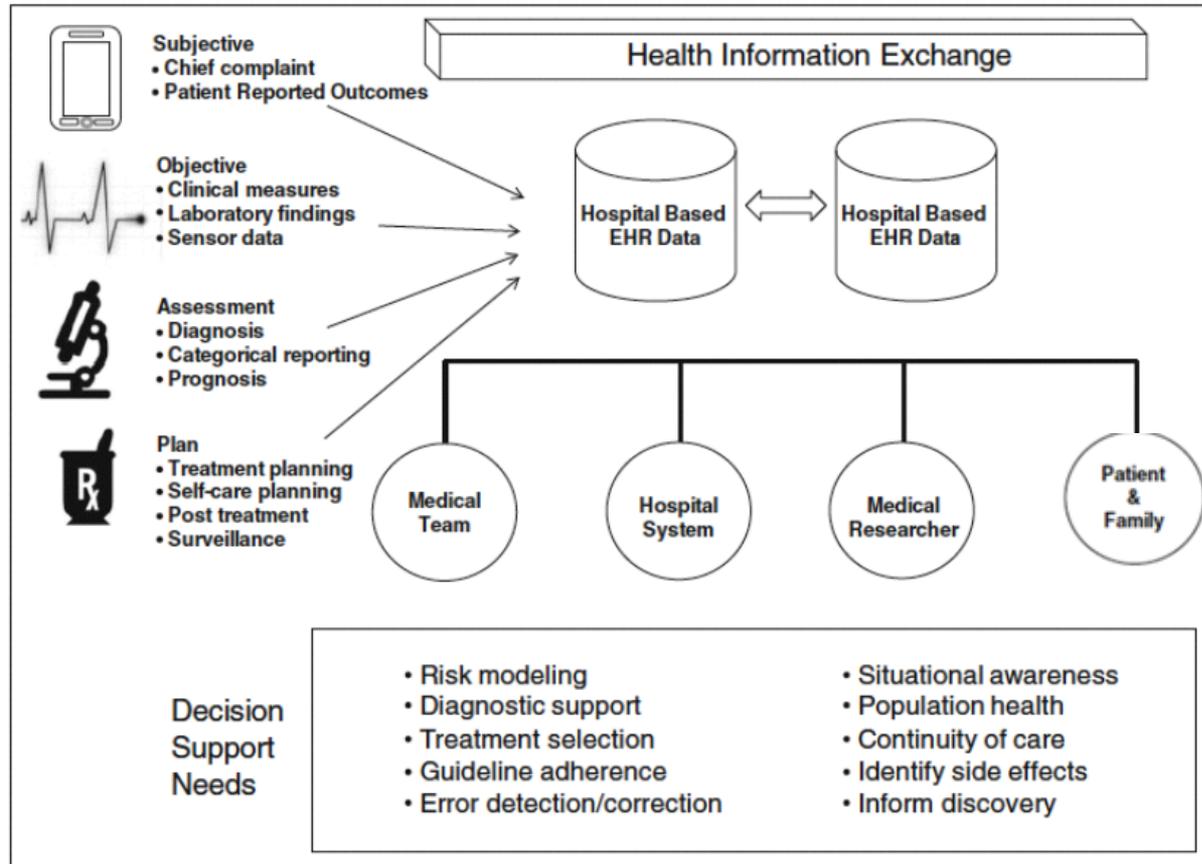
A screensnap of Apple's personal health record feature with iOS 11.3.

# APRIL, 2018

## Three Advantages

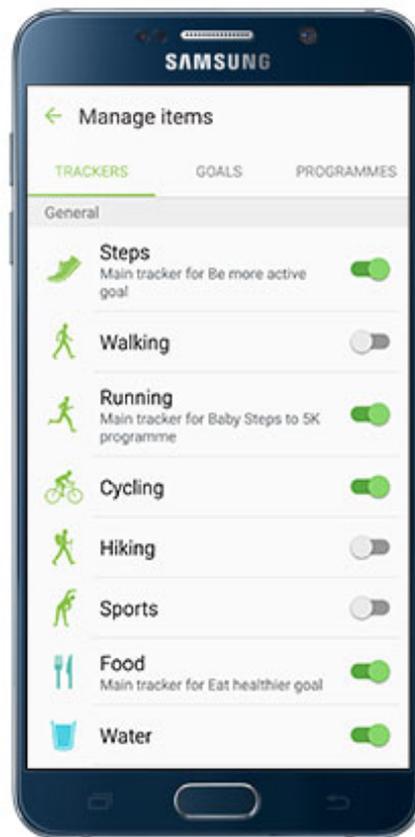
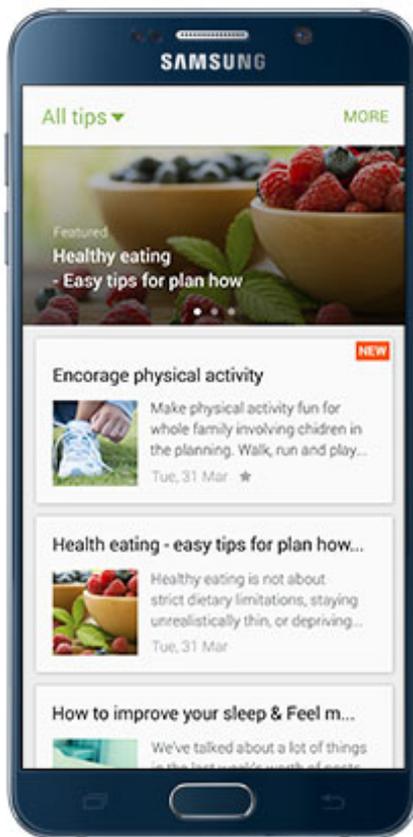
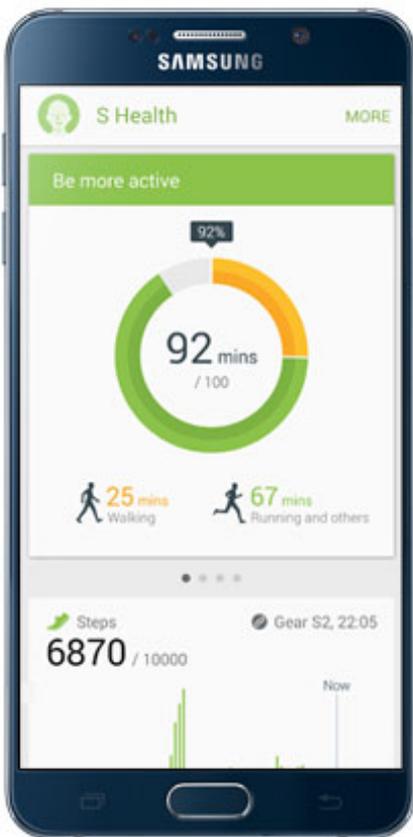
- Data from system to device
- Strength of the App Store
- Ubiquitous, intuitive design

# Creating the New Decision Architectures of Medicine



**Source:** Hesse, B. W. (2016). Decision Architectures. In M. A. Dieffenbach, S. M. Miller, & D. Bowen (Eds.), *Handbook of Health Decision Science* (pp. 15-28). New York, NY: Springer Verlag.

# Patients & Caregivers: Engagement Improves Outcomes

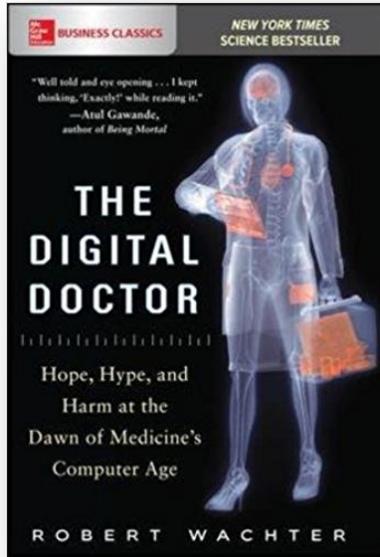


**Source:** Greene, J., Hibbard, J. H., Sacks, R., Overton, V., & Parrotta, C. D. (2015). When patient activation levels change, health outcomes and costs change, too. *Health Aff (Millwood)*, 34(3), 431-437.

# Doctors & Care Teams



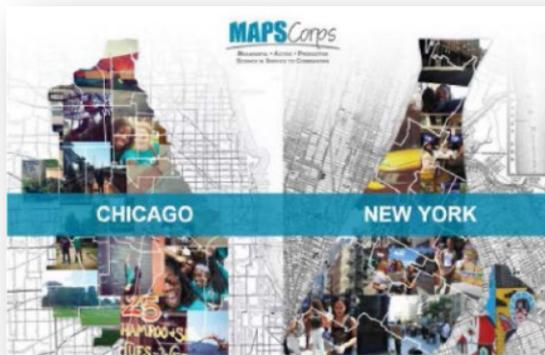
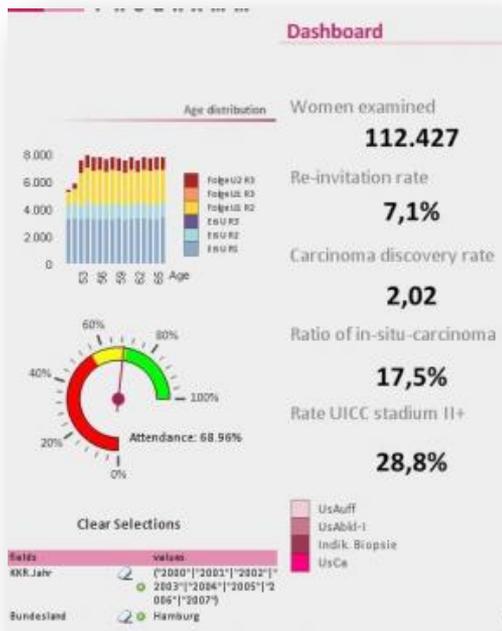
*The Wand Timeline view of a patient record in Allscripts ambulatory E.H.R. iPad application.*



Source: Shneiderman, B., Plaisant, C., & Hesse, B. W. (2013). Improving Healthcare with Interactive Visualization. *IEEE Computer*, 46(5), 58-66.

# Healthcare System, Public Health, & Community

Hospital System



**1. Local youth generate data**

<http://www.mapscorps.org>



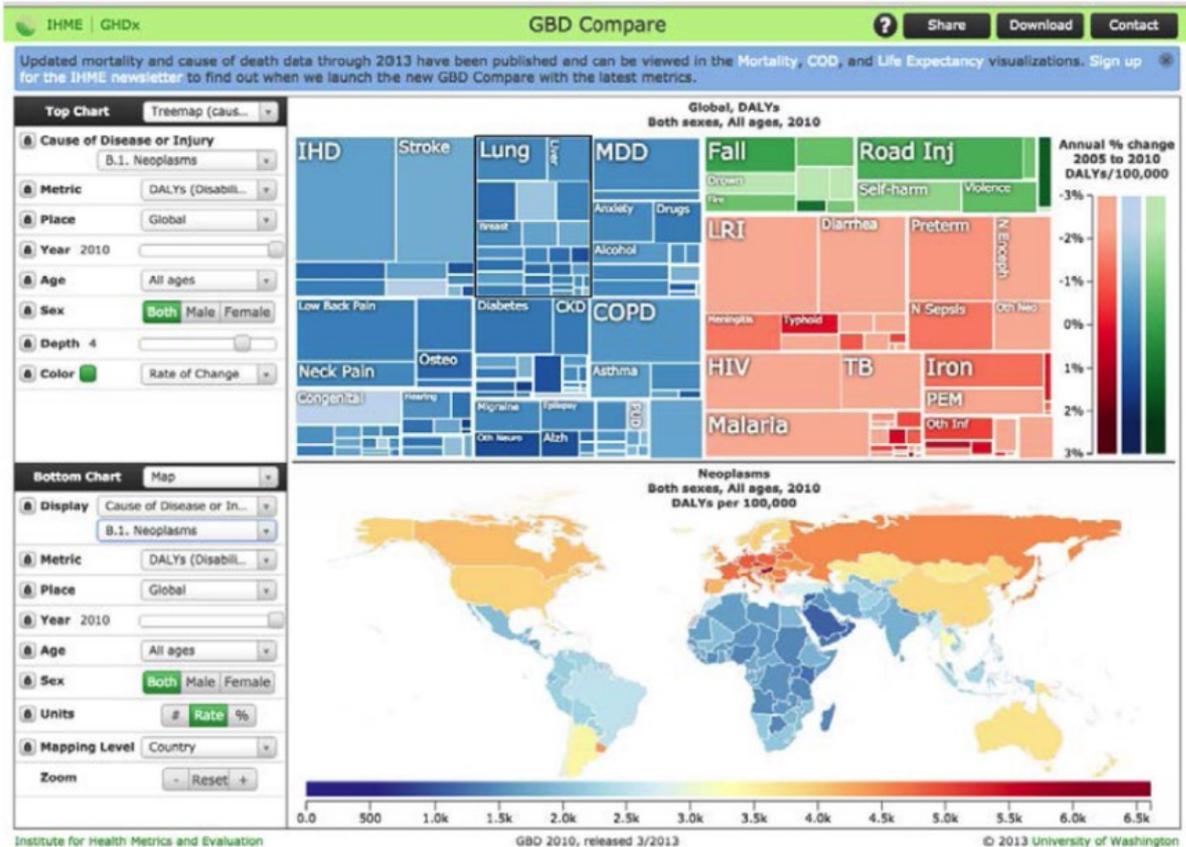
**2. Data link to the EMR**

<http://www.healthrx.org/>



**3. System electronically generates personalized referrals to community resources**

# Researchers: Overview, Filter, Details on Demand



Source: Onukwuga, O., Plaisant, K., Shneiderman, B. (2016). Data Visualization Tools for Investigating Health Services Utilization Among Cancer Patients In B. W. Hesse, D. K. Ahern, & E. B. Beckjord (Eds.), *Oncology Informatics* (pp. 207-230). Boston, MA: Elsevier.



# Why Data Visualization?

# To Improve the Interface of Care: To Create a Platform for Evidence Implementation



To create engaging, universal design -- leaving no patient behind.





To help clinical teams work together more efficiently, reduce burden, and protect the joy of medicine.

## Physician Burnout on the Rise, Healthcare Leaders Design Roadmap to Restore Joy in Medicine

© September 15, 2016



Vocera Communications, Inc. announced today that innovative solutions are within reach to reverse the climbing rates of physician burnout in America, thanks to research by a think tank of leading physicians, including the company's Chief Medical Officer Bridget Duffy, MD.



To manage populations, not just individuals; to reduce friction in service.



To provide “deep support” for patients and their providers in the clinic and in their lives.

