## ROME



#### **EXTINCT SPECIES**

Why Hospitals Will Be Obsolete And Medicine Will Be Digital

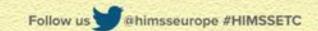
DANIEL MARTICH, MD, FACP



It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change.

Charles Darwin

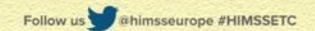


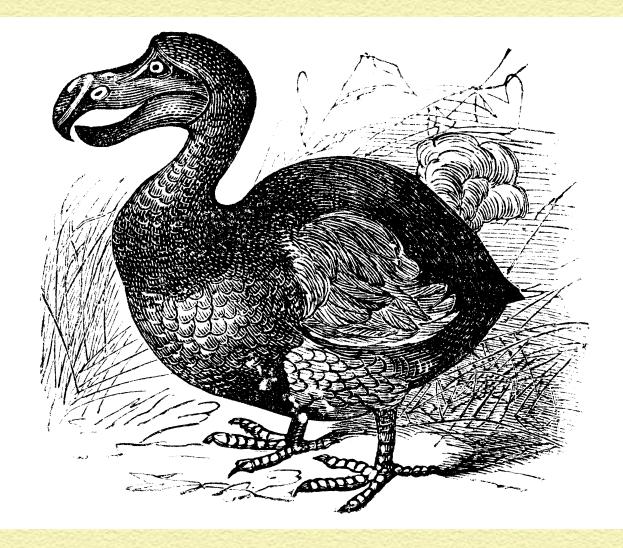




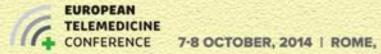
#### **Saber Tooth Tiger**

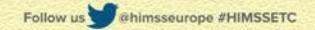






#### **Dodo Bird**

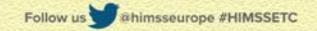




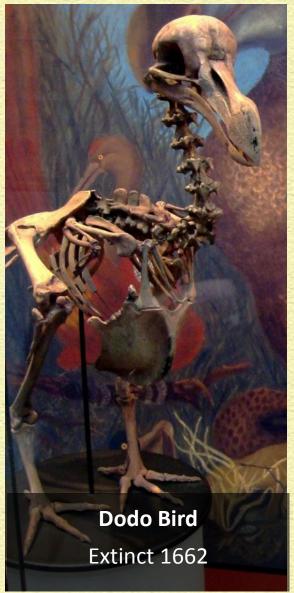


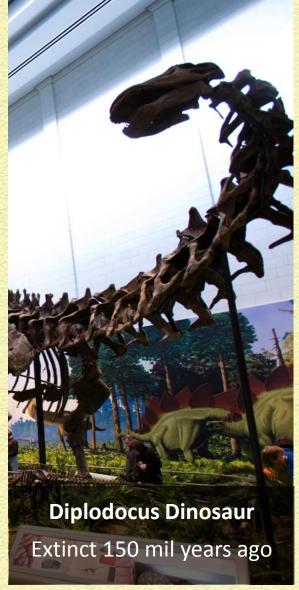
#### **Diplodocus Dinosaur**



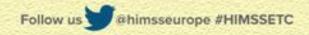








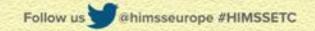


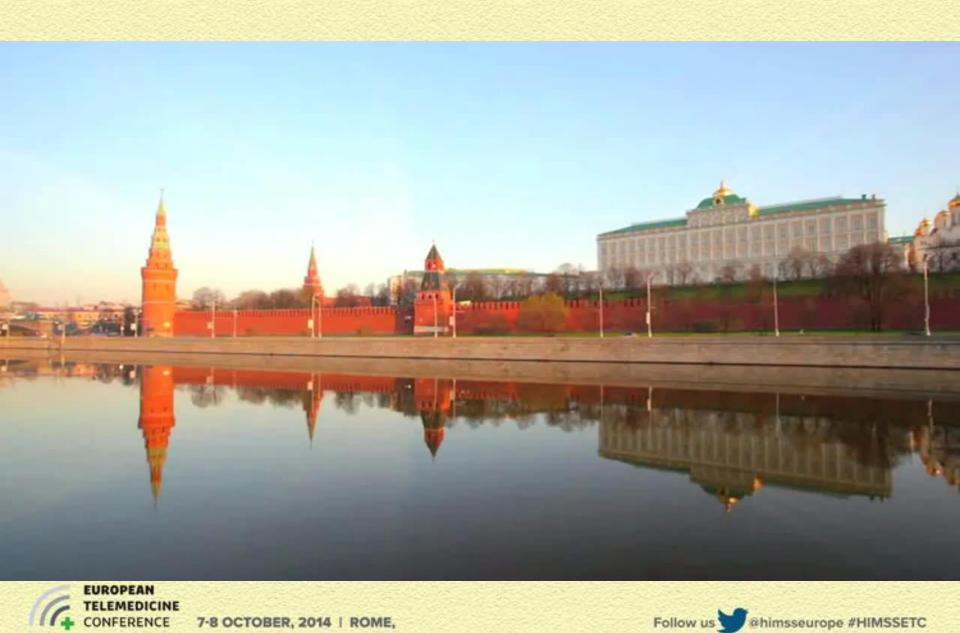


## **Russian Subway-Riding Dog**





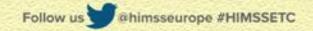




## **Can Healthcare Adapt?**









## Why Hospitals Will Be Obsolete And Medicine Will Be Digital

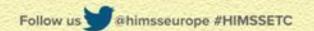
- Reinvention Past And Present
- Mhealth
- Social Media
- The New Healthcare Consumer
- UPMC



#### **Reinvention Past And Present**





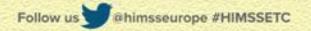


#### **Industrial Revolution**







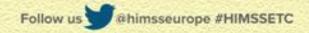


## **Cotton Picking Replaced By Machinery**









## **Steel Industry**

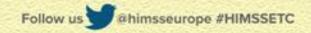




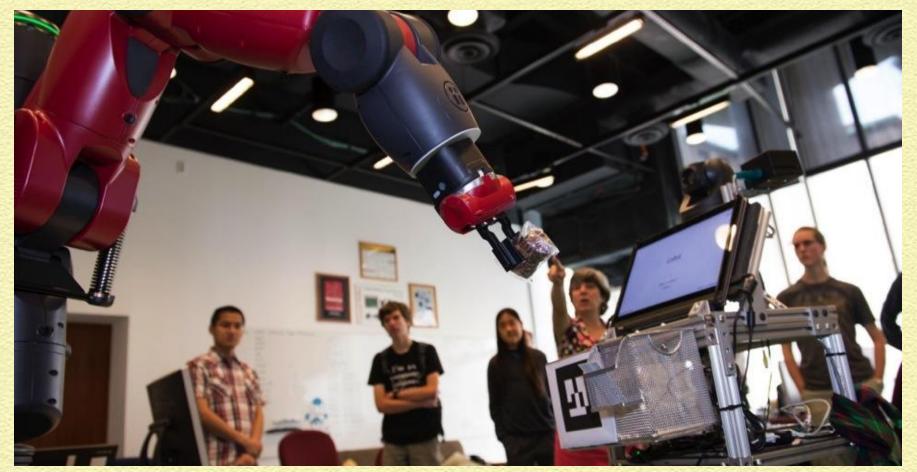
#### Pittsburgh, Pa, USA – End of the Steel Era



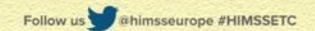




# Pittsburgh – Reinvented to Ed's, Med's, and Technology City



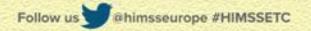




#### What Happened to Renting a Video?



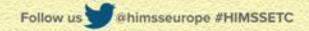




### Maybe You Remember This Store?



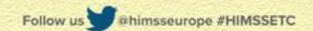




## A Similar Shakeup is Underway in Healthcare







#### Can We Adapt?

59%

Would prefer to use an at-home strep test purchased at a store



\*Truven Health MarketScan Database 2011



#### Can We Adapt?

55%

Would send a digital photo of skin problem to a dermatologist for an opinion



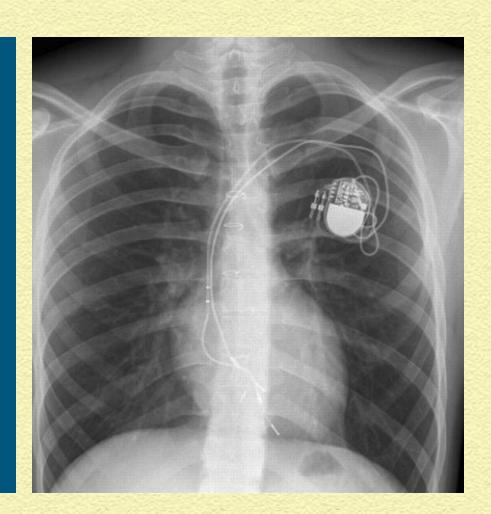
\*Truven Health MarketScan Database 2011



### Can We Adapt?

43%

Would have a pacemaker or defibrillator checked at home wirelessly by their physician



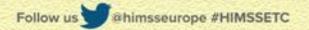
\*Truven Health MarketScan Database 2011



#### **Healthcare Is at a Crossroads**



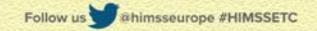




## More People Own a Mobile Device Than a Toothbrush



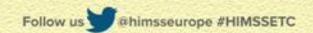




## **Smartphone Heart Monitor**



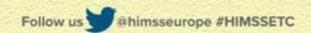




#### Mobile Health...On The Go



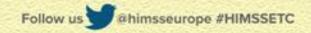




## **Smartphone Microscope**



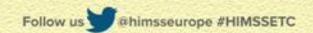




#### **AliveCor Smart Phone App**



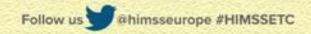




#### **Social Media**

#### Is Not Just Facebook





### The Social Media Disruption

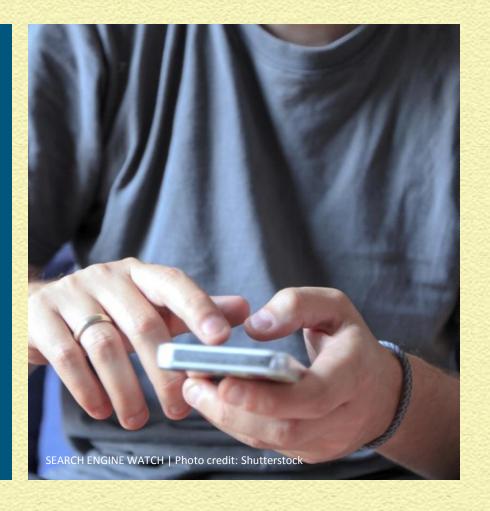




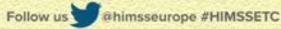
#### Social Media's Impact on Healthcare

90%

Would trust medical information shared by others on their social media networks.



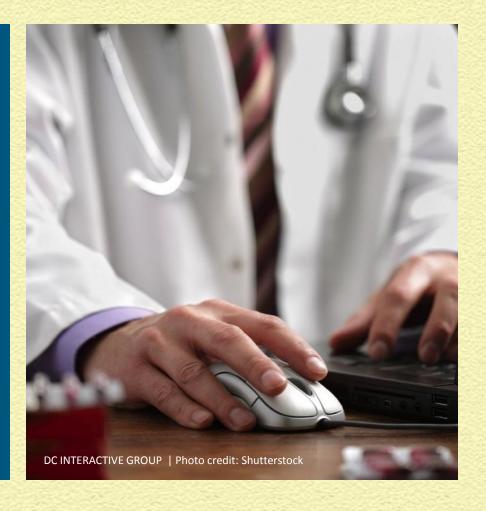




#### Social Media's Impact on Healthcare

60%

of doctors say social media improves the quality of care delivered to patients



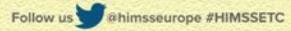
#### Social Media Impact on Healthcare

40%

said that information found on social media affects their view of diet and exercise and their selection of a physician







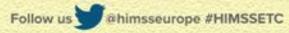
#### Social Media's Impact on Healthcare

30%

are likely to share information about their health on social media sites with other patients





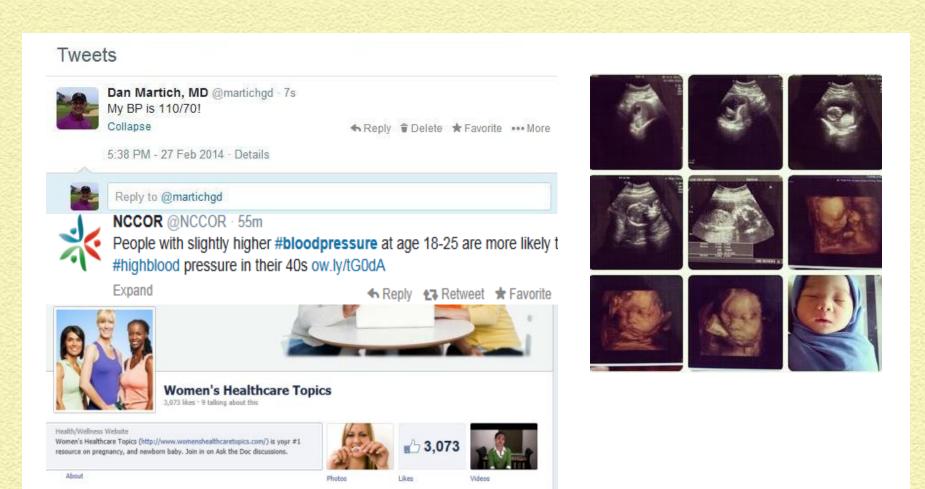


## Social Media Naturally Evokes Population Health Management





#### What Are You Tweeting?

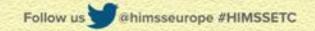




# Medicine Will Benefit From the Wisdom of Many



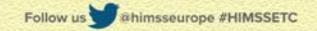




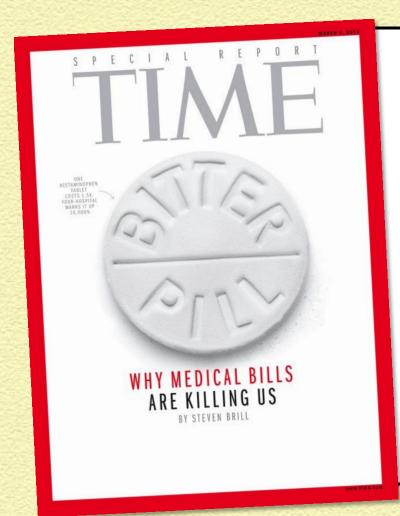
# The New Healthcare Consumer





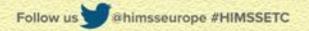


# The Truth Behind Healthcare Cost



You have no choice of the drugs that they have to buy or the lab tests or CT scans that you have to get, and you would not know what to do if they did have a choice. You are a powerless buyer in a seller's market where the only sure thing is the profit of the sellers.

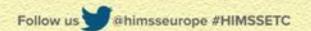




# The New Consumer is Shopping in More Than One Place



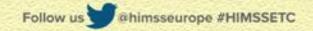




# **Mostly Getting Their Information Online**



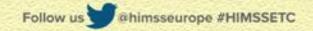




# **Consumers Love Devices**



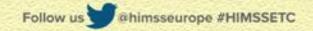




# **Especially Devices That Give Them Information About Themselves**





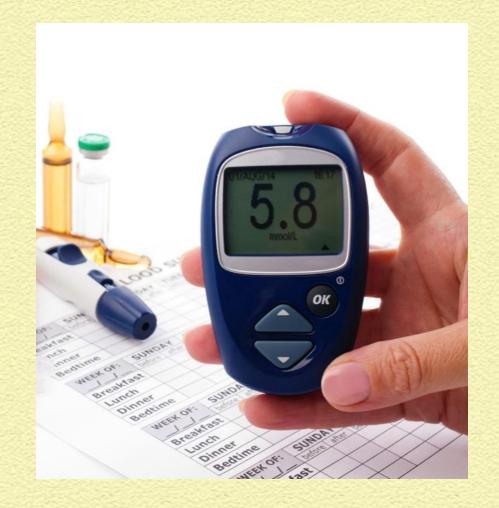


# The Good News Is Devices Are Now Being Used for Healthcare Monitoring

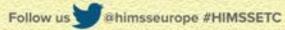
Medical device integration (MDI) - process of taking the data from those devices and integrating it to an EHR.

Examples include defibrillators, electrocardiographs, vital signs monitors, ventilators and infusion pumps

- Diabetes Mellitus glucometer
- Obstructive Lung Disease spirometer
- CHF scale







# **Patients Are Helping Themselves**

Wall Street Journal Article | Laura Landro

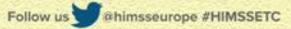
# The Health-Care Industry Is Pushing Patients to Help Themselves

Providers are Using Tech Tools and Personalized Approaches to Get Patients More Engaged

Hospitals, doctors and public-health officials are pushing patients to keep track of their medical data, seek preventive care and stay on top of chronic conditions. They're measuring how motivated patients are to manage their own health and adopting a wide range of strategies to help them do better, a concept known as patient engagement.







# An Engaged Patient is a Healthy Patient

## The Four Levels of Patient Activation

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

### Predisposed to be passive

Patients lack the confidence to play an active role in their health.

'My doctor is in charge of my health."

GENERAL POPULATION:

10-15%

Source: Insignia Health

#### Building knowledge and confidence

Patients have some knowledge but large gaps remain. They can set simple goals.

'I could be doing more.'

#### Taking action

Patients have the key facts and are building skills. They are goal-oriented.

'I'm part of my healthcare team."

20-25% 25-30% 20-25%

### Maintaining behaviors, pushing further

Patients have adopted new behaviors but may struggle in times of stress or change. Healthy lifestyle is a key focus.

'I'm my own advocate.'



"How Doctors Rate Patients," Wall Street Journal, Landro, March 31, 2014

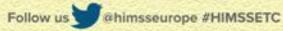
# The New Healthcare Consumer

Patients don't stop being consumers – customers – when they put on a hospital gown

Micah Solomon Forbes Contributor

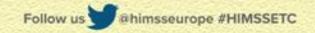


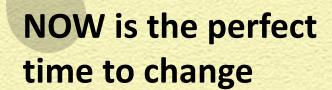




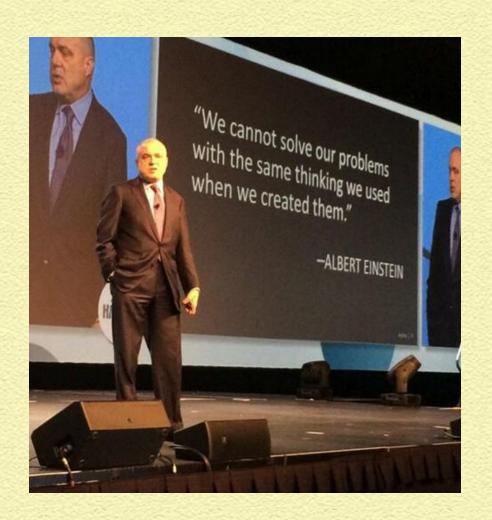
# A Living Lab For Digital Medicine



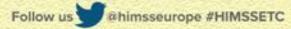




Mark Bertolini HIMSS 2014







# \$11 billion

in revenue

62,000

employees

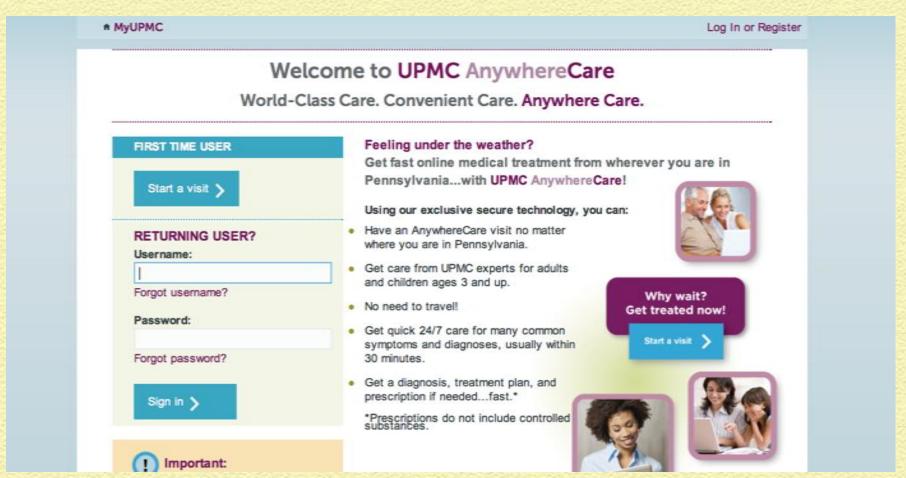
## 2.1 million

members in health insurance plan

**3,100** employed physicians



## eVisits/Anywhere Care





## Wall Street Journal Article | Laura Landro

## **Health-Care Providers Want Patients to Read Medical Records, Spot Errors**

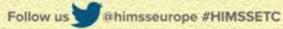
The aim is to move patients and doctors into a relationship of "shared accountability"

Health-care providers are giving patients more access to their medical records so they can help spot and correct errors and omissions.

Studies show errors can occur on as many as 95% of the medication lists found in patient medical records.







## **Open Notes**

#### **Annals of Internal Medicine**

#### ORIGINAL RESEARCH

# Inviting Patients to Read Their Doctors' Notes: A Quasi-experimental Study and a Look Ahead

Tom Delbanco, MD\*; Jan Walker, RN, MBA\*; Sigall K. Bell, MD; Jonathan D. Darer, MD, MPH; Joann G. Elmore, MD, MPH; Nadine Farag, MS; Henry J. Feldman, MD; Roanne Mejilla, MPH; Long Ngo, PhD; James D. Ralston, MD, MPH; Stephen E. Ross, MD; Neha Trivedi, BS; Elisabeth Vodicka, BA; and Suzanne G. Leveille, PhD, RN

Background: Little information exists about what primary care physicians (PCPs) and patients experience if patients are invited to read their doctors' office notes.

Objective: To evaluate the effect on doctors and patients of facilitating patient access to visit notes over secure Internet portals.

Design: Quasi-experimental trial of PCPs and patient volunteers in a year-long program that provided patients with electronic links to their doctors' notes.

Setting: Primary care practices at Beth Israel Deaconess Medical Center (BIDMC) in Massachusetts, Geisinger Health System (GHS) in Pennsylvania, and Harborview Medical Center (HMC) in Washington.

Participants: 105 PCPs and 13 564 of their patients who had at least 1 completed note available during the intervention period.

Measurements: Portal use and electronic messaging by patients and surveys focusing on participants' perceptions of behaviors, benefits, and negative consequences.

Results: 11.797 of 13.564 patients with visit notes available opened at least 1 note (84% at BIDMC, 92% at GHS, and 47% at HMC). Of 5391 patients who opened at least 1 note and completed a postintervention survey, 77% to 87% across the 3 sites reported that open notes helped them feel more in control of their care; 60% to 78% of those taking medications reported increased medication adherence; 26% to 36% had privacy concerns; 1% to 8% reported that the notes caused confusion, worry, or offense; and 20% to 42% reported sharing notes with others. The volume

of electronic messages from patients did not change. After the intervention, few doctors reported longer visits (0% to 5%) or more time addressing patients' questions outside of visits (0% to 8%), with practice size having little effect; 3% to 36% of doctors reported changing documentation content; and 0% to 21% reported taking more time writing notes. Looking ahead, 59% to 62% of patients believed that they should be able to add comments to a doctor's note. One out of 3 patients believed that they should be able to approve the notes' contents, but 85% to 96% of doctors did not agree. At the end of the experimental period, 99% of patients wanted open notes to continue and no doctor elected to stop.

Limitations: Only 3 geographic areas were represented, and most participants were experienced in using portals. Doctors volunteering to participate and patients using portals and completing surveys may tend to offer favorable feedback, and the response rate of the patient surveys (41%) may further limit generalizability.

Conclusion: Patients accessed visit notes frequently, a large majority reported clinically relevant benefits and minimal concerns, and virtually all patients wanted the practice to continue. With doctors experiencing no more than a modest effect on their work lives, open notes seem worthy of widespread adoption.

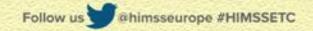
Primary Funding Source: The Robert Wood Johnson Foundation, the Drane Family Fund, the Richard and Florence Koplow Charitable Foundation, and the National Cancer Institute.

Ann Intern Med. 2012;157:461-470.
For author affiliations, see end of text.

www.annais.org

\* Dr. Delbanco and Ms. Walker contributed equally to this manuscript





## **Open Notes**

#### A PIECE OF MY MIND

#### Michael W. Kahn, MD

Department of Psychiatry, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

#### Sigall K. Bell, MD

Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

#### Jan Walker, RN, MBA

Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

#### Tom Delbanco, MD

Department of Medicine, Beth Israel Deaconess Medical Center, Harvard

#### Let's Show Patients Their Mental Health Records

Should we health professionals encourage patients with mental illness to read their medical record notes? As electronic medical records and secure online portals proliferate, patients are gaining ready access not only to laboratory findings but also to clinicians' notes. Primary care patients report that reading their doctors' notes brings many benefits including greater control over their health care, and their doctors experience surprisingly few changes in workflow. While patients worry about electronic records and potential loss of privacy, they vote resoundingly for making their records more available to them and often to their families.

As consumers urge that fully open medical records become the standard of care, policy makers, clinicians, and patients advocate also that mental illness gain far more attention and support. <sup>4</sup> Primary care physicians and medical and surgical subspecialties have long managed many patients with mental illness, but with the exception of the Department of Veterans Affairs, most systems implementing open records continue to carve out from patients' view "behavioral health" notes written by psychiatrists, psychologists, and social workers. We believe such exclusions are unnecessary.

Inviting patients to read what clinicians write about

find their writing more efficient and to the point: "Ms Jones and I continued our discussion of her tendency to use 'black-or-white-thinking' in ways that make her relationships at work problematic." "Mr Smith and I continue to 'agree to disagree' about his conviction that his apartment is bugged." "Ms Williams expressed dissatisfaction with my treatment decisions quite clearly, but preferred not to talk about that today. I encouraged her to discuss our disagreements in the future."

This approach—descriptive, nonjudgmental summarizing—can help with documenting many potentially value-laden subjects. A patient's addiction to Internet pornography may be deeply troubling, and his doctor or social worker would be justifiably worried about shaming him further by documenting it. This might be noted as "Mr Martin and I continued our discussion of his addictive behavior and reviewed techniques for dealing with it." This principle can also be applied to a variety of sensitive topics, including psychodynamic issues. The medical record should offer a practical synopsis of a patient's history and treatment, but it does not need to contain an exhaustive catalog of vulnerabilities.

Kahn, Bell, Walker, Delbanco, JAMA April 2, 2014 Volume 311, Number 13



5,000,000+

results auto-released to

300,000+

MyUPMC patients since January 2010





Medications

Allergies

Medical History

Preventive Care

Test Results

**Immunizations** 

**Health Trends** 

Tracking Tools

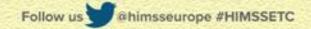
#### **Test Results**



The availability of your test results may vary from immediate release to approximately 14 days. If your results are not displayed by their estimated time, please contact your doctor's office.

The test results you are about to review may contain information that may be confusing or cause concern. If you have not already communicated with your provider we recommend you contact him/her to discuss and clarify the meaning of your results.





urgent conditions.

#### Websites That Offer Care Over the Internet Is There an Access Quality Tradeoff? Table. Characteristics of e-Visit Websites That Pro

ealth Ratings Center,

r Health Policy nucles, The Center for dicine, University of

Supplemental ontent at jama.com

and eTable 1 in the Supplement), but all provide a novel alternative to traditional care for low-acuity conditions such as bronchitis and urinary tract infections (UTIs). They offer convenience not only to patients but to clinicians. Most offer flexible hours, free malpractice insurance, and the opportunity to gain supplemental income for telephone and e-mail services that are often unreimbursed at traditional practices. New York Times and Wall Street Journal articles have reported that e-visit companies are attracting venture

capital and that employers are seeking ways to reduce premiums and medical absenteeism. Like retail clinics. e-visit companies may be at the forefront of a "convenience revolution" in low-acuity care.2 A recent case study of Virtuwell, an online clinic associated with Health-Partners' bricks-and-mortar network, demonstrates the potential for online care to be cost-effective and guide line driven.<sup>3</sup> However, the rapid proliferation of standalone e-visit websites has created a diversity of practices with unexamined consequences for patients and physicians. In particular, some aspects of the care provided at some websites may have unintended effects on use, diagnostic accuracy, or continuity.

The pressure to satisfy customers in a timed virtual appointment with limited access to follow-up may drive evisit clinicians to underuse diagnostic procedures and reach unjustified conclusions (or write unnecessary prescriptions). A study comparing e-visits with office visits found that e-visits had significantly higher antibiotic prescribing rates for UTIs, with less confirmatory testing.4 Visitors to Ezdoctorsrx.com select products from a "Catalog of Online Prescriptions" with the assurance that "[i]f you do not qualify for a prescription, your visit is FREE." Furthermore, many sites partner with laboratory and imaging companies to offer products, such as an annual "Comprehensive Wellness Profile," that include far more testing than recommended by the US Preventive Services Task Force. One site sells nutritional supple-San Francisco, 3333 California, PO Box ments with the tagline, "Doctors not only recommend our products to their patients, THEY take them as well." 0936, Ste 265, San Francisco, CA 94118

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Although health care is one of the largest industries in the United States, 73% of US residents who are ill have difficulty obtaining nonemergency care on nights, weekends, and holidays. The shortage of accessible primary care drives overuse of emergency departments for non-Commercial e-visit websites—companies without bricks-and-mortar clinics that use the Internet to connect patients to clinicians whom they never meet in person-may address the need for accessible, convenient care. These websites vary in cost and structure (Table

Online Care for Simple Conditions

\* See eTable 2 for URLs of examples (in the Supp IAMA April 2, 2014 Volume 311, Number 1

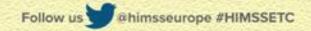
## Websites That Offer Care Over the Internet Is There an Access Quality Tradeoff?

Although health care is one of the largest industries in the United States, 73% of US residents who are ill have difficulty obtaining nonemergency care on nights, weekends, and holidays. 1 The shortage of accessible primary care drives overuse of emergency departments for nonurgent conditions.

Commercial e-visit websites—companies without bricksand-mortar clinics that use the Internet to connect patients to clinicians whom they never meet in person may address the need for accessible, convenient care.

DeJong, Santa, Dudley; JAMA April 2, 2014 Volume 311, Number 13, page 1287-1288





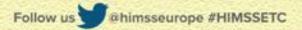
There will be 100 million e-visits globally in 2014, up 400% over 2012.\*

This can potentially save \$5 billion (compared to costs in face-to-face).



\* Deloitte | HIT Trends Aug 2014





There are 600 million annual primary care visits in North America with half for problems that could be handled with e-visits.\*



<sup>\*</sup> Deloitte | HIT Trends Aug 2014



## eVisits/Anywhere Care

Table. Comparison of Care at E-visits and Office Visits for Sinusitis and Urinary Tract Infection (UTI)

Variable	Sinusitis, No. (%)			UTI, No. (%)		
	E-visit (n = 475)	Office Visit (n = 4690)	P Value	E-visit (n = 99)	Office Visit (n = 2855)	P Value
Provider at visit	ALCOHOL: WO	West Washington		100 March		
Patient's designated PCP	194 (39)	2154 (42)	.04	40 (40)	1833 (64)	<.001
Follow-up						
Follow-up visit in following 3 weeks for same condition	26 (5)	224 (5)	.43	7 (7)	204 (7)	.98
Follow-up phone call or e-mail in following 3 weeks for the same condition	1 (0.2)	32 (1)	.23	4 (4)	129 (5)	.82
Orders for tests or consultations for condition						
Any relevant test for that condition <sup>a</sup>	0	40 (1)	.04	8 (8)	1501 (51)	<.001
Sinus x-ray film or CT	0	14 (0.3)	.23	NA	NA	NA
Urine culture	NA	NA	NA	7 (7)	893 (31)	<.001
Antibiotic prescribing						
Any oral antibiotic prescribed	471 (99)	4408 (94)	<.001	98 (99)	1407 (49)	<.001
Antibiotic prescribed for 5 days or less (among those with prescription) b	NA	NA	NA	40 (41)	434 (31)	.04
Antibiotic prescribed was guideline recommended or patient allergic to one of the guideline antibiotics (among those prescribed an antibiotic) c	331 (70)	3120 (67)	.83	98 (100)	1299 (92)	.07
Preventive and chronic disease care ordered at visit <sup>d</sup>						
Preventive care	1 (0)	155 (3)	<.001	0	214 (7)	.005
Chronic disease test (eg, hemoglobin A <sub>1c</sub> )	0	168 (4)	<.001	1 (1)	190 (7)	.02

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## eVisits Vs. Office Visits

### **Benefits of eVisit**

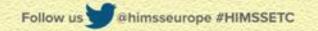
- Convenience and efficiency
- Lower costs \$38
- Provided by Primary Care Physician/ Advanced Practice Providers

### **Potential Drawbacks of eVisit**

- Can a physician make an accurate diagnosis?
- Are correct tests and follow up ordered?
- Are drugs being overprescribed?
- Medical Malpractice issues
- Technical issues of video vs text only
- Connected devices
- State licensure in order to be able to prescribe across state lines

"A Comparison of Care at E-visits and Physician Office Visits for Sinusitis and Urinary Tract Infection," *JAMA INTERN MED, Mehrotra et al* 173 (NO. 1), 72-74 (JAN 2013)





Tomorrow...





# The future starts today, not tomorrow.

Pope John Paul II



