

The Connected Health Imperative

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How will the future look?

Images removed due to copyright restrictions.
Images of potential home-based healthcare products and services.

About the Center for Connected Health

Partners HealthCare

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- Using consumer technologies and online resources to deliver quality care to patients outside the medical setting
- Creating new ways to deliver care *when* and *where* it is needed

The Connected Health Imperative

Growth in Chronic Disease

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Chart showing growth, between 1990 and projected to 2020, in number of deaths due to chronic diseases such as diabetes mellitus, chronic obstructive pulmonary disease and asthma, neoplasms, cardiovascular diseases, and other noncommunicable diseases.

Supply and Demand Projections for Nurses: 2000 to 2020

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Graph showing drop-off in supply and steady rise in demand for nurses between 2000 and 2020 (projected).

Rising Costs

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Graph showing the rise in America's spending on health care as a percentage of GDP, from 1970 to 2003; graph suggests increase of about 8%.

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Hospital doctors shut doors to new patients

- The Boston Globe, 12 November 2006

- “Most primary care physicians at Boston's top-tier teaching hospitals are so busy that they have officially closed their practices to new patients.”
- "There is a huge crisis in primary care right now," said Dr. Sherry Haydock, medical director of Internal Medicine Associates, a primary care practice at Mass. General

The Connected Health Imperative

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.

Patient-centric

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Illustrative photographs.

- Care when and where it is needed
- Patients have access to their own health data
- Self management increases quality and capacity
- *“I noticed my weight was up – I knew you’d be calling”*

What are some ideas you have for using technology to create a more patient-centric care system?



Connected Health: Fundamental Challenges

- Self-care: tools and support to comply with care plans
- Remote care: Care when and where it is needed

Connected Health Platforms

Self-Care Platform

Self-Care Platform

Feedback

Motivation &
support

Patient
education

Remote Care Platform

Remote Care Platform

Remote
monitoring

Remote
diagnostics

Remote care
delivery

Connected Health Initiatives

Medication Adherence

X

Self Care Platform

Feedback

Motivation & support

Patient education

Remote Care Platform

Remote monitoring

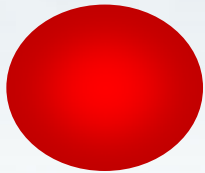
Remote diagnostics

Remote care delivery

Connected Health Initiatives: Medication Adherence

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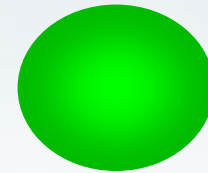
- **Clinical trial to study the impact of real-time information and feedback on adherence rates**
- **Goals include assessment of patient view of using ‘background’ devices for personal reminders**



Medicine is taken.
(Photo removed due to copyright restrictions).



Medicine container detects change in pill count. (Photo removed due to copyright restrictions).



Connected Health Initiatives

		Medication Adherence	Virtual Coach
Self Care Platform	Feedback	X	X
	Motivation & support		X
	Patient education		X
Remote Care Platform	Remote monitoring		
	Remote diagnostics		
	Remote care delivery		

Connected Health Initiatives: Virtual Coach – Empathic Agent

1. Wearable
monitor records
subject's
activity levels

2. Activity data
sent wirelessly
to central
server

Images removed due to copyright restrictions.

3. Personalized
coaching to
improve
adherence to
activity regime

Connected Health Initiatives

		Medication Adherence	Virtual Coach	Heart failure Monitoring
Self Care Platform	Feedback	X	X	X
	Motivation & support		X	
	Patient education		X	X
Remote Care Platform	Remote monitoring			X
	Remote diagnostics			
	Remote care delivery			X

Connected Health Initiatives: Heart Failure Monitoring

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- **Homebound patients are being monitored to manage heart failure, COPD, renal failure, etc...**
- **Tele-monitoring nurse monitors patient vital signs daily and prioritizes nurse visits based on patient status**
- **Prior study showed that HF patients with tele-monitoring required 40% fewer nursing visits and had a 25% reduction in re-hospitalization rates.**

Home Monitoring Patient

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9 Months Post Trial Data

- Primary dx of CHF: 22% re-hospitalization rate (30/136)
- Secondary dx of CHF: 24% re-hospitalization rate (9/38)
- For the telemonitored patients with **primary** CHF there was a 5.2% re-hospitalization rate
- There were **no patients** with a secondary diagnosis of CHF re-hospitalized in the 9 months
- For the MGH telemonitored patients there was an overall (all diagnosis) re-hospitalization rate of 13.8%.

Describe how CHF is a model system for showing the value of connected health technologies.



Connected Health Initiatives

		Medication Adherence	Virtual Coach	Heart failure Monitoring	Acne E-visits
Self Care Platform	Feedback	X	X	X	
	Motivation & support		X		
	Patient education		X	X	
Remote Care Platform	Remote monitoring			X	X
	Remote diagnostics				
	Remote care delivery			X	X

Connected Health Initiatives:

Acne E-visits

- **Online “e-visits” to replace in-person visits**
- **Secure communications, image transfer**
- **Partnering w/ BCBSMA to demonstrate value**

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E-visits patient

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Connected Health Initiatives

		Medication Adherence	Virtual Coach	Heart failure Monitoring	Acne E-visits
Self Care Platform	Feedback	X	X	X	
	Motivation & support		X		
	Patient education		X	X	
Remote Care Platform	Remote monitoring			X	X
	Remote diagnostics				
	Remote care delivery			X	X

Connected Health provides value by:

- **Improving quality** - more robust data
- **Improving supply**
 - More effective use of providers
 - Care when and where its needed
- **Decreasing demand**
 - Increasing self-care
- **Lowering costs**
 - Moving care to lower cost environment
 - Using patient data (physiologic and functional status) to move decision-making to lower cost providers
- **System value** - capacity to take in, synthesize, and act on data from outside of the system

Connected Health Markets

- Medicaid/Free care
- Medicare High Risk
- Commercial – including Pay for Performance
- Employee benefits/wellness
- Caregivers/elder care
- Consumers/sports & fitness

Medicaid/Free care and Medicare

Representative data of Medicaid and free care patients in a hospital

Number of ED visits per 1000 patients: 98

Number of admissions per 1000 patients: 13

55% of all hospital admissions in 2003 started in the emergency dept.

- Medicare and Medicaid cover 66% of all hospital admissions through the ED

Policy makers are concerned with the overuse or inappropriate use of EDs among people with limited access to ambulatory care

Commercial Pay for Performance Targets

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Employee Health and Wellness

- Review of 73 published studies of worksite health promotion programs shows an average of \$3.50-\$1 savings-to-cost ratio in reduced absenteeism and healthcare cost

Employee Risk versus Healthcare Costs

Outcome measure	Low-risk	Medium-risk	High-risk	Excess cost (%)
Short-term disability	\$120	\$216	\$333	41%
Worker's comp	\$228	\$244	\$496	24%
Absence	\$245	\$341	\$527	29%
Medical & pharmacy	\$1158	\$1487	\$3696	38%
Total	\$1751	\$2288	\$5052	36%

Wright, Beard, Edington. JOEM. 44(12): 1126-1134, 2002

Define the value proposition for:

- Medicaid/free care
- High cost Medicare
- Commercial payers (P4P)
- A large self-insured employer

Ways to Learn More

Join our discussion at
www.connected-health.org

Just published:
Home Telehealth

Thank you.

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